PAPER TEARING

AND MODELLING FROM TORN MATERIAL.

A COURSE OF EDUCATIONAL HANDWORK
FOR SCHOOLS AND TRAINING COLLEGES.

PART II

PAPER TEARING
AND MODELLING FROM TORN MATERIAL

BY

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"Paper Folding and Modelling from Cut Material"

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LIST OF PLATES.

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INTRODUCTION.

N submitting the second of a series of textbooks in which paper is used as the medium for formative training, the author desires to express his thanks to the many teachers and educationists, to whose use and appreciation of the former part of the scheme, the appearance of this issue is largely due.

Until recent years Handwork in Paper was considered merely a necessary appendage to the work of the Kindergarten. As such, there was claimed for it no special aim, beyond that of a training in the neat, accurate folding of pleasing patterns. No connecting link existed with the larger scheme of occupational education. Careful research and experimental work have however brought a change. Work in paper has outgrown its old sphere, and is now certain to play an important part in the future development of the power in the child to think constructively.

For this purpose work in paper has many advantages over other media It is a material with which every child is familiar. Its cost is trifling. With it results can

be obtained such as the proving of simple geometrical theorems in the minimum of time It presents to the teacher, student, or pupil almost unlimited variety and possibilities of construction As a potent factor in education Handwork in Paper appeals with equal force to the teacher of the Primary, Junior, and Senior Divisions of our schools

The work in this course is intended for children of the Junior division who have completed the scheme of Paper Folding in Part One It is desirable that this condition should be fulfilled as the methods of general construction as well as those applied to folding and tearing adopted in the former course are utilised and elaborated without special explanation throughout this stage It is therefore necessary to the full understanding of these methods that the work of the two parts be taken in sequence

The essential difference between the work of the two courses is that, whereas, in the former, the models are constructed from pieces of paper which have been cut for the pupils to the exact size and shape, in the present course—with few exceptions—both dimensions and shape are obtained by the pupil This change renders necessary the introduction of some method by which the children can measure the material supplied for the various models and thereafter reduce it to the measured size It may be presumed that in the case of most children this will be their first experience in the actual use of measurements, it is therefore important that the initial instruction in methods of measuring should be on sound lines With this view the Card Ruler

illustrated on Page 17 has been specially designed It is the product of numerous experiments in teaching children, and, after using rulers of various sorts, including dimensioned strips of cardboard, it has been adopted as possessing all the advantages of the narrow ruler, while it has several additional features to recommend it It provides a clean, smooth surface on which to work, as the roughness of the school desk often proves a hindrance to successful folding The central arrangement of squares acts as a testing sheet in determining a right angle when folding In certain cases it also makes the use of the left hand, as well as the right compulsory in folding and creasing as dimensions are determined from left to right In this connection, teachers using the ruler should modify their methods so as to ensure a fair amount of left hand folding, creasing, and tearing No smaller unit than a quarter of an inch is used on the Ruler, and it is believed that the skill in transferring simple measurements unconsciously acquired by the child in the execution of the simple problems of the course, will appear with telling effect in the subsequent stages of school work

The practice which was adopted in the first course—that of the pupil tearing all supplementary openings in the cut paper which were necessary in the construction of the models—makes a further step now possible, that of tearing the outline edges of the paper, as well as these additional openings

This substitution of the torn outline for the cut is a change which entails serious effort on the part of the pupil The children, by the time they reach this stage, know

what constitutes a really well torn edge, and many are even able to appreciate the artistic beauty of successful tearing as compared with the cut produced by the knife or machine

The forms to be torn include the Square, Oblong, Rhombus, Equilateral Triangle, Hexagon, and Right Angled Triangle An exception is made with the last mentioned form which is not torn on all three sides This is done either with a view to providing, as in models 2, 3, and 4, a gradual transition from the cut to the torn shape, or it is done, as later in the course, with a view to economy of material The latter point requires constant attention from the teacher of the class engaged in preparing material with torn edges

It will be observed that in the diagrams used on Page 27, illustrating the method of obtaining a square by tearing, an irregularly shaped piece of paper is used The reason for this is to show that, while in general practice roughly squared or rectangular pieces of paper are used for tearing the original form has no bearing on the finished shape

Several features of the former course have been retained in the present scheme No tools are used except the Card Ruler Glue is not needed a small damp sponge being the only apparatus required for the execution of the models Strips, discs, and square and triangular tickets of gummed paper are again employed for fastening, while at the same time their application is so arranged as to add a decorative feature

to the work. Space is provided, as formerly, at the end of the book for notes, sketches, or other matter pertaining to the work at this stage. Materials for the course have again been carefully selected, prepared, and packed in cardboard boxes similar to those issued for Part One.

The various hints given to teachers in the introduction to Part One also apply here, and should be acted on.

While the examples selected for this Course are mostly new, one or two old types have been retained and furnished with features of fresh interest. Many drawings and suggestions for alternative models are given; these could easily have been multiplied, but in doing so no good purpose would be served. The additional examples are given in order that they may act as an incentive to further effort in this direction on the part of teacher and pupil alike.

In Part One teachers were advised to have their children "follow prescribed and directed operations alone." This remark, the author well knew, would call for strong dissent from advanced advocates of self-expressional work from the child; but facts must be faced: the elements of a language must be taught before a child can be expected to express himself in that language. To quote from Part One "The models while carefully selected and arranged, are intended to be taken as typical and suggestive only." This remark should apply with increasing force to the work of Part Two.

A good teacher is always on guard against *over teaching*, just as he is careful to avoid *under teaching*, and no class work in the school affords a teacher a better opportunity than this to form a correct judgment of the individual power of the pupils for work By all legitimate means encourage honest, individual effort in the children, but the shortest road to genuine work of the self expressional type is to begin by laying a sure foundation of well directed method, and sound instruction, in the early stages of Handwork

In conclusion, it seems almost superfluous to remind teachers that the making of these little objects in paper—however valuable may be the training and discipline acquired in the process—does not exhaust, but rather only visualises, the wealth of information and imagination with which the alert teacher will clothe the childrens efforts Even the Pyramids, probably the most uninteresting of all the exercises to a Junior Class, will, if associated with the History, English, Geography, or Religious Knowledge Lessons, produce a more truthful and lasting impression, both of the shape and of the story of the great Egyptian structures, than if the one lesson were unconnected with the other. If the children are of a suitable age these models may be used to demonstrate the geometric forms—Triangle, Hexagon Rhombus, &c.—and to illustrate such terms as Base Altitude, Diagonal, Acute, Right, and Obtuse Angles, or, the models when made in a Junior Class may be sent to a class in the Senior Division of the school to be used as problems for the actual measurement and calculation of areas and volume.

The value of Association in the hands of a capable teacher can scarcely be over-estimated, but, there is a misuse of Association just as there can be a misuse of Illustration, and any undue straining after correlation is undesirable. The best methods of correlation can rarely even be suggested; they come with spontaneity to the teacher who is wrapt up in his work.

The author gratefully acknowledges the kind assistance with the illustrations given by Mr George Cunningham, and with the designing of examples by Miss Mary Fraser and Mr John Calder.

Moray House,
Edinburgh.

PAPER FOLDING AND MODELLING FROM CUT MATERIAL,
PART I.

PAPER TEARING AND MODELLING FROM TORN MATERIAL,
PART II.

MATERIALS FOR PARTS I. AND II.,
ALSO
CARD RULERS FOR USE WITH PART II.,
Prepared in Sets for 10, 25, and 50 Pupils.

The above Books and Materials can be had through all Educational Publishers or direct from the Author.

APPLIED RULER DRAWING AND PAPER MODELLING,
Part III. of this Issue in course of preparation.

CARD RULER.

The Card Ruler illustrated on page 17 is used for obtaining on paper the various measurements necessary in constructing the models.

It is made from a piece of white cardboard about ten inches square, the central portion of which is ruled in square inches.

This portion ruled off into squares is marked like a scale, the zero line being one unit from the left hand, with this said unit on the extreme left divided into quarters of an inch.

On each of two opposite edges of the square a part eight inches long is marked as in a school ruler. These marked edges should be used when it is more convenient to apply the ruler to the paper than the paper to the ruler.

The other two edges of the square are bound with metal to provide a durable edge with which to make ruled lines.

Method of Measuring on Card Ruler

1 Fold and tear two edges of a piece of paper at right angles to each other (see Instructions 1, 2, and Illustrations I, II, and III, pp 26 and 27)

2 Place the paper with the torn edges fitting the zero line and top dimensioned line of the ruler (Fig 2)

3 Hold the paper firmly in this position with the fingers of the left hand, then fold the top edge of the paper back upon itself and crease down—in this case—the five inch line (Fig III)

4 Tear off the surplus material and proceed to determine the second dimension of the paper in the same manner

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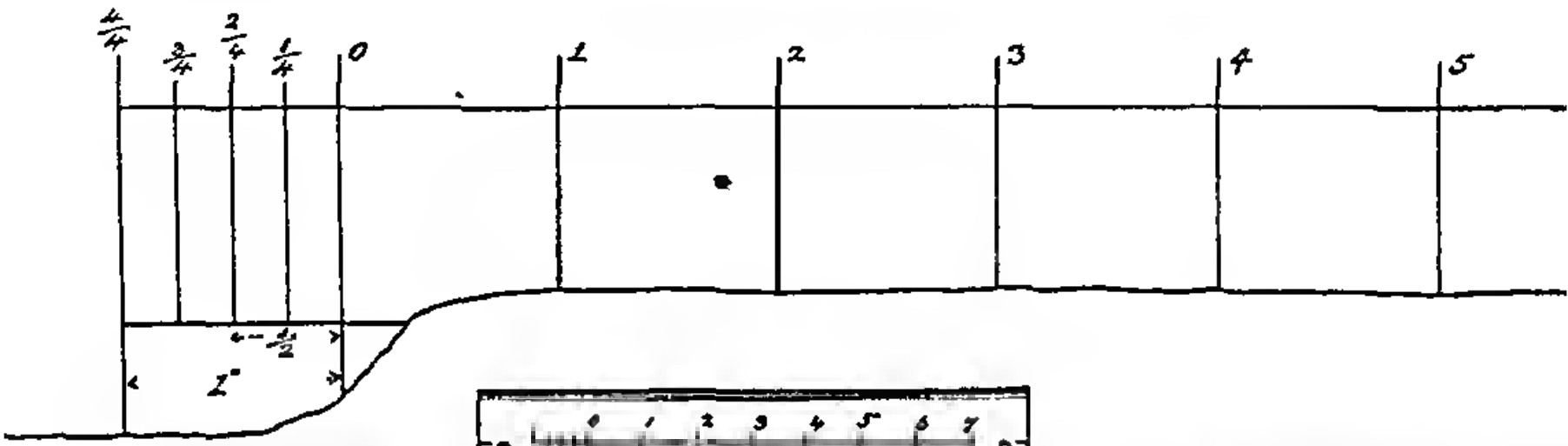
The edge marking on the ruler would be used for such purposes as obtaining the quarter inch measurements to right and left of the centre of the business envelope (see Fig II, page 43)

The method of marking adopted in the interior rule is after the fashion of a practical working scale this being the most convenient method of obtaining, on rectangular areas, measurements of inches plus parts of an inch

The markings on the edges are after the pattern of the rulers in general use in schools, and which are likely to be employed in succeeding stages of the work

CARD RULER.



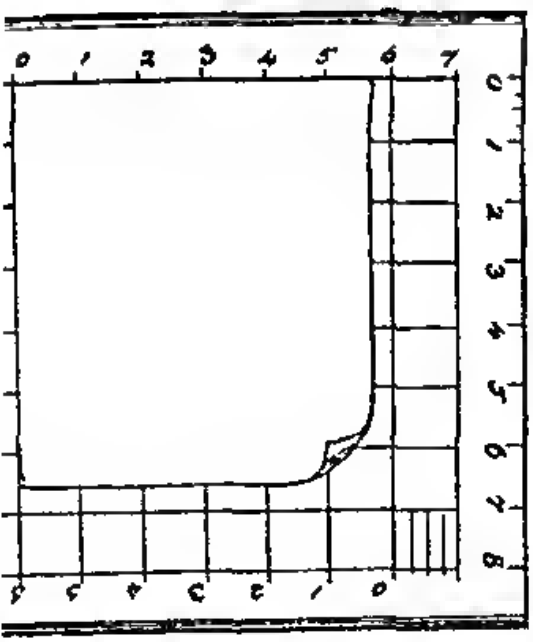


FIG II

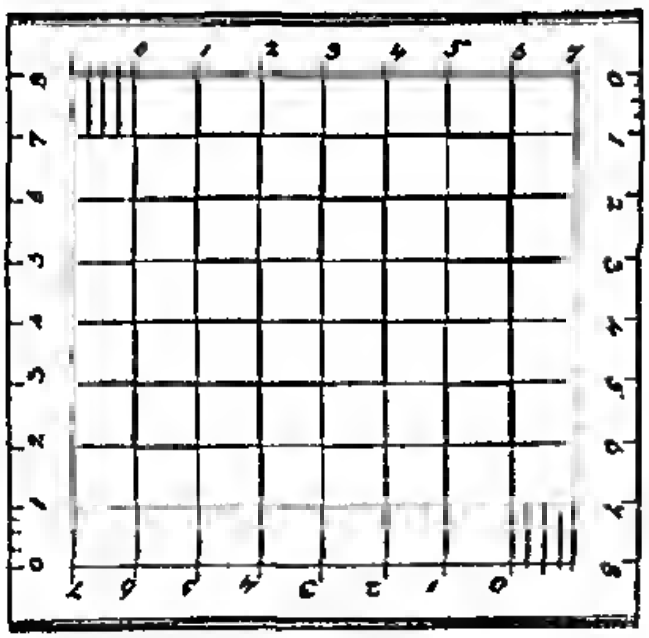


FIG I

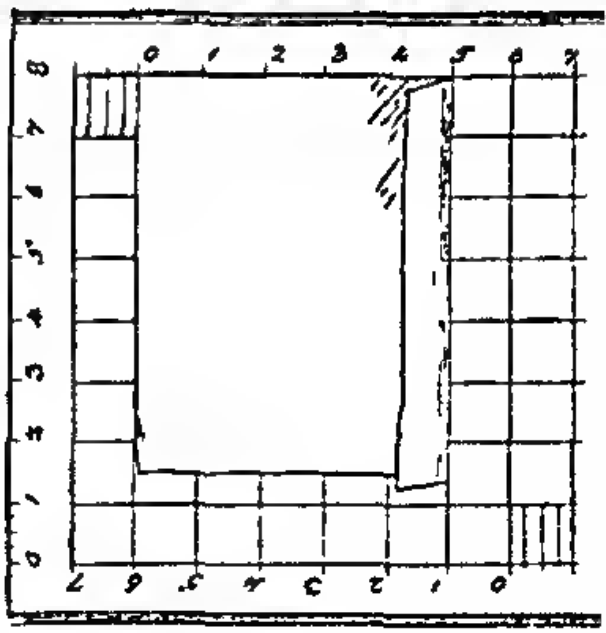


FIG III

I—WALLET.

MATERIAL Kraft Paper 15" × 8", 2 pieces Gummed Paper 9 × 1"

METHOD

1 Place the vertical edge *a c* on the zero line of the card ruler

2 Fold the corner *a* over upon the edge *a b*, and crease with the thumb nail of the left hand down the three inch line as at *e f* (Fig I)

3 Turn the paper about so that *d b* coincides with the zero line, and repeat as at *a c* creasing at *g h* (Fig I)

4 Fold the two strips of gummed paper lengthwise along the centre (Fig II)

5 Open out flat and mark off three inches from each end, at these marks double over the unfolded strip upon itself, and crease from the central line to the downward edge (Fig II)

6 Tear along the short creases thus formed (Fig II)

7 Place the edge *e h* of the wallet upon the intact half of one of the strips and fix down the end thirds upon it (Fig I)

8 Secure the third in the middle and attach in similar fashion the second strip to the opposite edge of the wallet

9 Fold the edge *e f* over to coincide with edge *h g*, and crease down centre line (Fig III)

For storage of unfinished work, these wallets may either be folded as in Fig III or kept flat when they are used to hold large pieces of material They are intended only for holding models in course of construction It is suggested that a cardboard boot or other box (which the children can easily obtain) should be used by each child for the storage of completed work when it is desired to retain the finished work of the pupils

I.—WALLET.

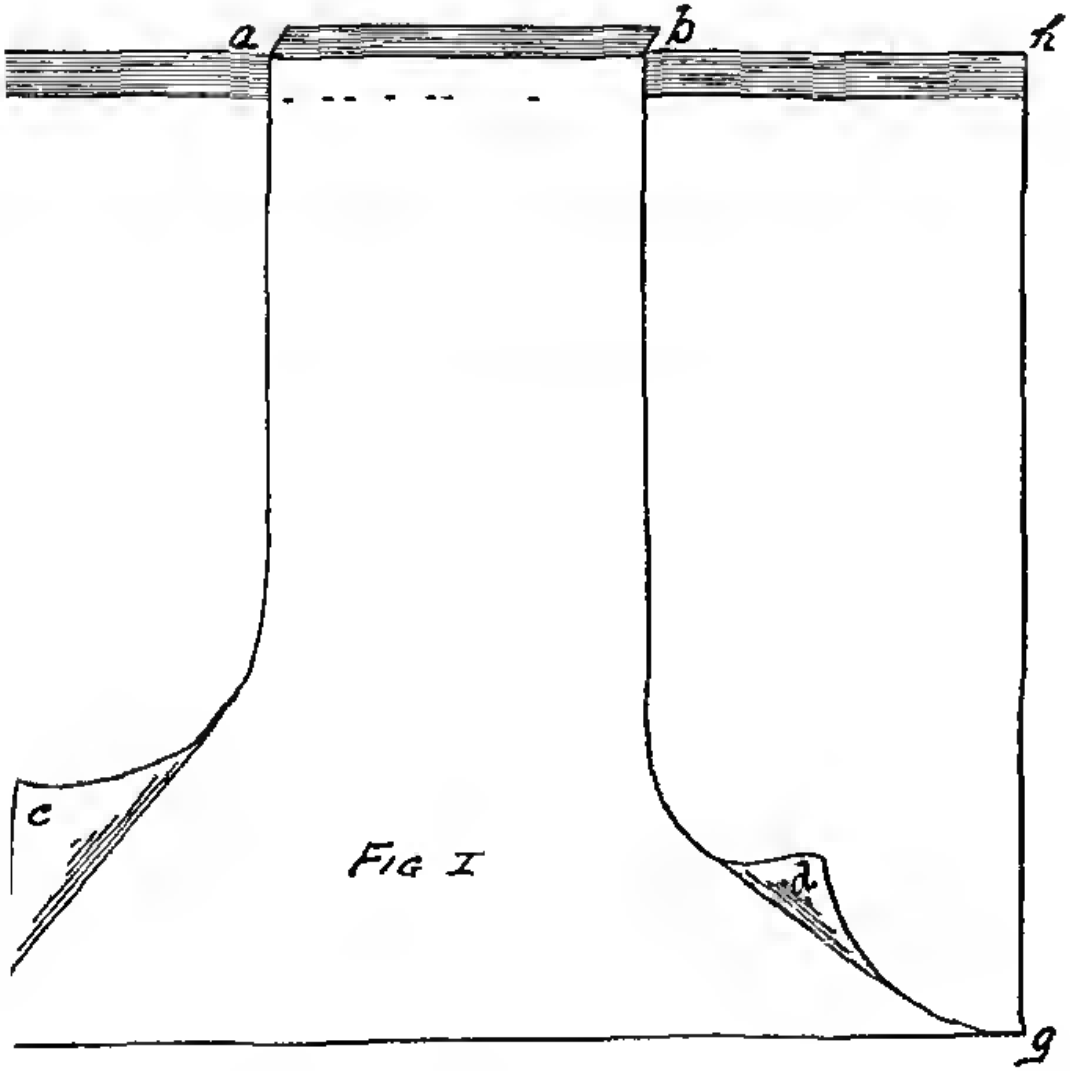


FIG I

FIG II

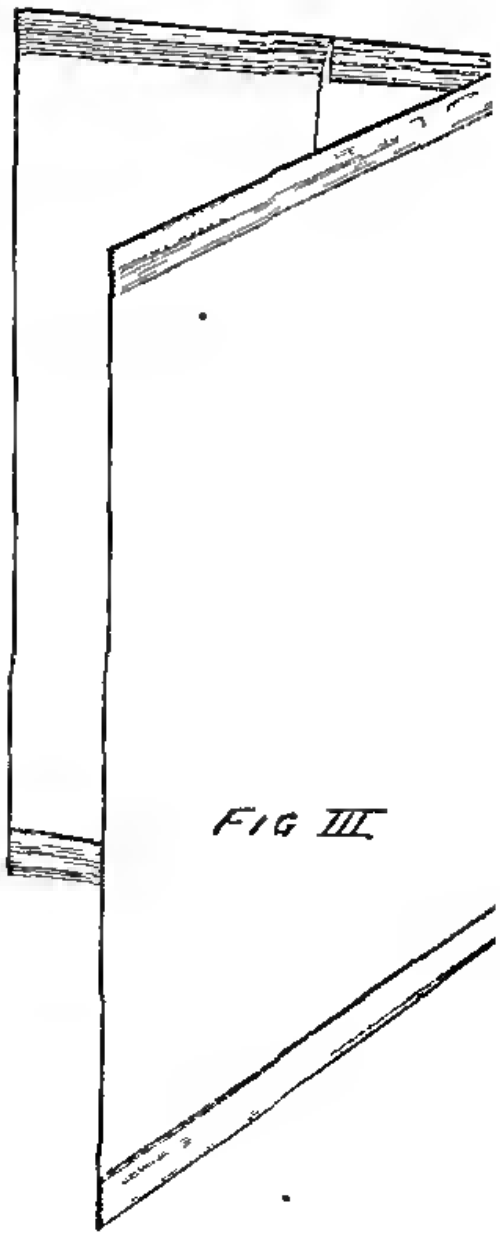


FIG III

II—FILLER

MATERIAL FOR MODELS No 2 3 4 Tinted Paper $11\frac{1}{2}'' \times 6\frac{1}{8}''$

MATERIAL FOR FILLER Triangle No 2 Gummed Strip $3\frac{1}{2}'' \times \frac{1}{2}''$

METHOD

1 Fold crease and tear to obtain triangle marked No 4 (Fig I)

2 Repeat to obtain triangle No 3

3 Fold crease and remove the waste from triangle No 2

4 Using the right angled triangular form No 2 fold corner *b* over to *a* and crease at *d c* (Fig II)

5 Fold the paper so that the edge *b c* will coincide with *d c* crease at *e c* (Fig III)

6 Similarly fold so that the edge *a c* coincides with the fold *d c* thus obtaining the fold *f c* (Fig IV)

7 Fold the corner *a* forward on the line *a c* crease from the point *f* and tear from 2 to *f*

8 Fold and crease the corner at *b* by the same method tearing from 1 to *e*

9 Fold the paper along the centre line *c d* and the gummed strip along the centre lengthwise

10 Attach so that the lower corners of the gummed strip touch the centre lines *e c* and *f c* when fixed (Fig V)

11 Moisten and turn inward the upper end of the gummed strip at 1

12 Tear off point *c* along the lower end of the strip (Fig VI)

This model may be used as a filler for liquid powder, or sand

II.—FILLER.

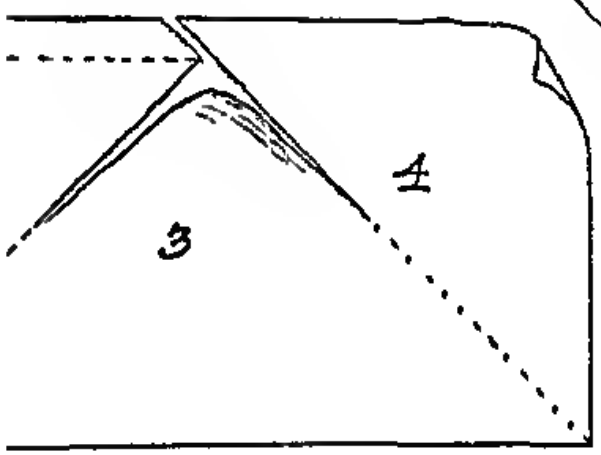


FIG. I.

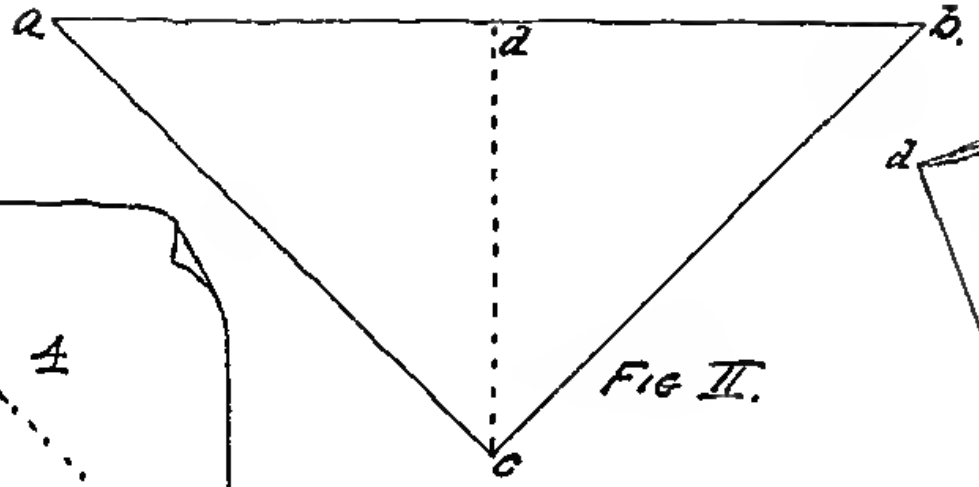
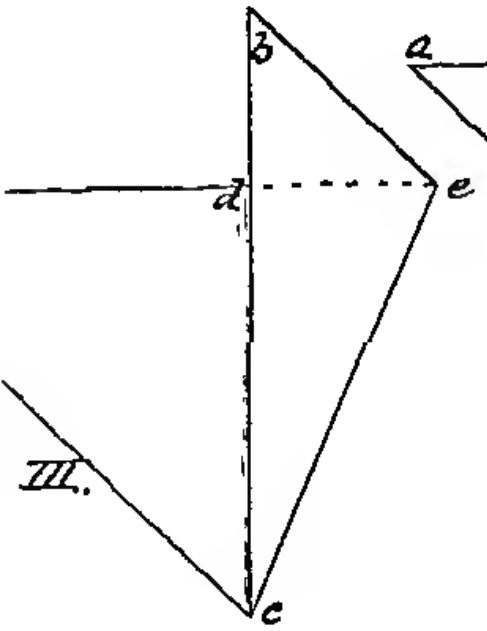


FIG. II.



III.

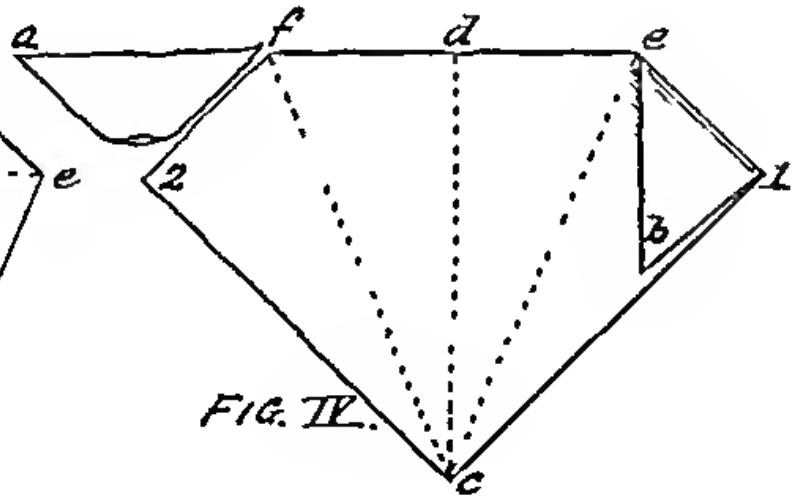


FIG. IV.

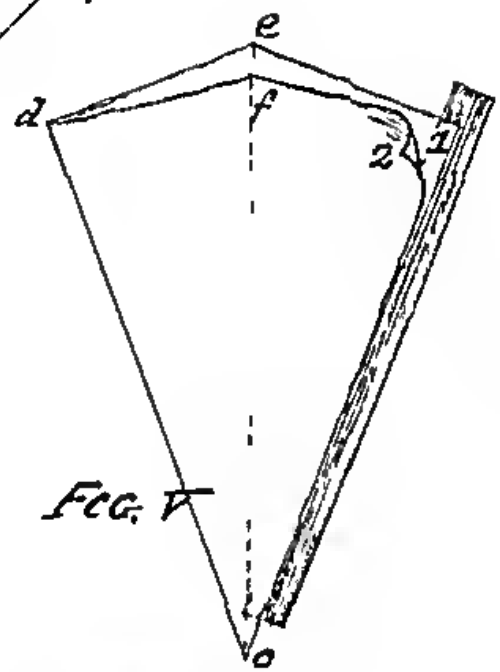


FIG. V.

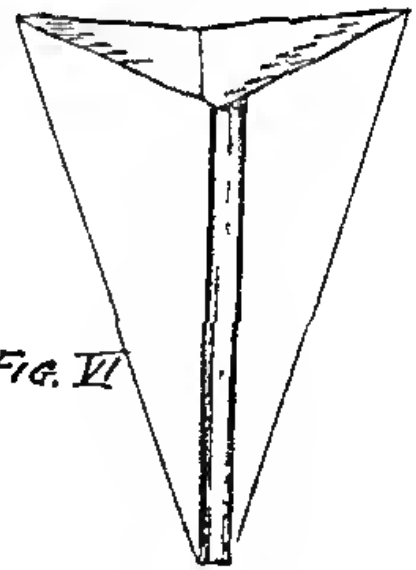


FIG. VI.

III—TRINKET POUCHES

MATERIAL Right Angled Triangle No 3 a piece of Thread or Raffia

METHOD

1 Fold corners *a* and *b* to corner *c* and crease thus obtaining folds 1 2 and 2 3 (Fig I)

2 Fold corner *c* to point 2 and crease at 1 3

3 Tear along the line 1 3 removing the triangular part *c*

4 Fold edge 2 *b* along the line 2 1 and 2 *a* along the line 2 3 (Figs II and III) crease to obtain 2 *d* and 2 *e* (Fig IV)

5 Hold the paper by the edges *a* 1 and *b* 3 (Fig IV) Fold so that the corner *b* meets and passes in front of corner *a* until the line *b* 2 touches the line 1 2 (Fig V)

6 Mark the point *f* where the edges *b* 3 and *a* 1 intersect (Fig V)

7 Open out the model until edge 2 *b* touches point *f* (Fig VII)

8 Fold the corner *b* backward closely over the edge *a* 1 and corner *a* forward over the edge *b* 3 (Fig VI)

9 The corners *a* and *b* can either be left outside as shown in Fig VI or inserted between the folds of the back of the pocket as in Fig VIII Alternative methods are given for attaching the thread

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The construction of the alternative design shown in Fig VII differs from the foregoing in that the folded lines 2 1 2 3 2 *e*, and 2 *d* are obtained before removing any waste at *c* The torn edge at 1 3 is then substituted by a torn edge joining *d e*

The Pouch may also be finished as shown in Fig V, the corners being left projecting and the model fastened with a longer thread

III.—TRINKET POUCHES.

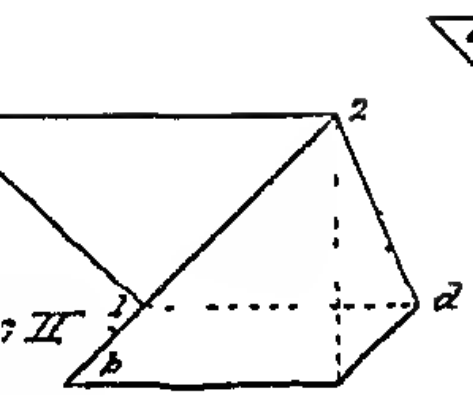

FIG II.

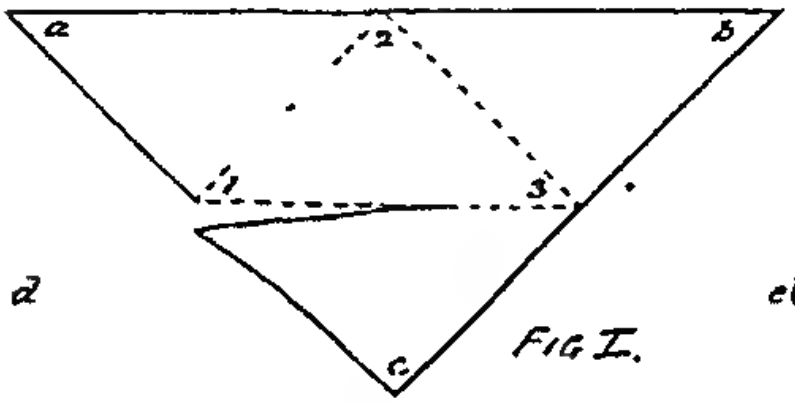

FIG I.

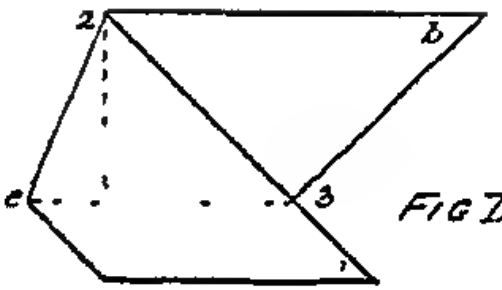

FIG III.

FIG VIII.

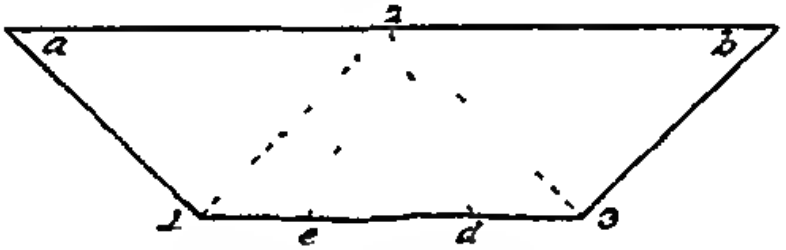

FIG IV.

FIG VI.

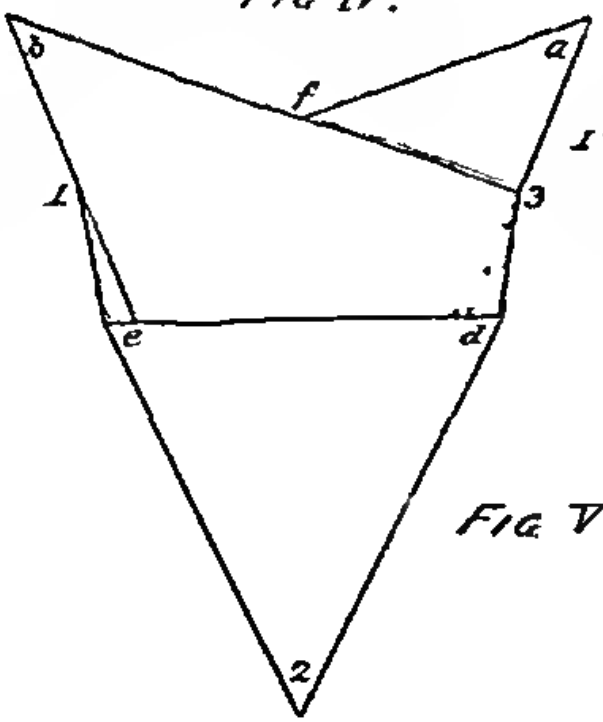

FIG V

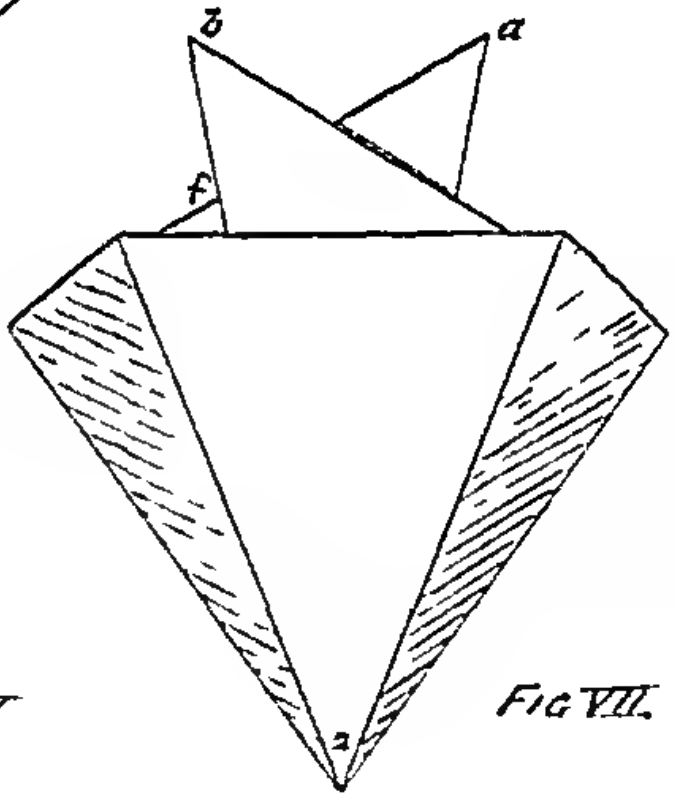

FIG VII.

IV—TRAY FOR SMALL FRUIT

MATERIAL Right Angled Triangle No 4 4 Semi Discs 2 Triangular Gummed Tickets

METHOD

1 Take the triangular piece of paper previously torn and marked No 4 Place the edge *a c* on the zero line of the card ruler and mark with pencil the edges *c b* and *a b* at the points where they coincide with the one inch line on the ruler

2 Treat edges *c b* and *a b* similarly

3 Fold the three edges upward and forward—creasing firmly—through the points marked

4 Fold corner *a* back upon the line *a b* and *a c* creasing from point 1 (the apex of the smaller triangle) the lines 1 2 and 1 3 respectively (Fig I)

5 Repeat at corner *b*

6 Tear out the corner parts as shown in Fig II

7 Bisect the inch margins by folding backwards through the points 4 5 (Fig II)

8 Rule a light line through the points 4 5 at each of the three corners (Fig II)

9 Attach on the right angled corner of the model the triangular ticket to the paper outside the line at point 5 also in the same manner at the other two corners fix the semi discs (Fig II)

10 Raise up the sides of the model and attach the opposite corner of the tickets close to the lines 4 This will give the form Fig III

11 Place the duplicate tickets supplied immediately underneath those holding the model in position

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If a larger tray is desired Triangle No 3 may be used for this model

IV.—TRAY FOR SMALL FRUIT.

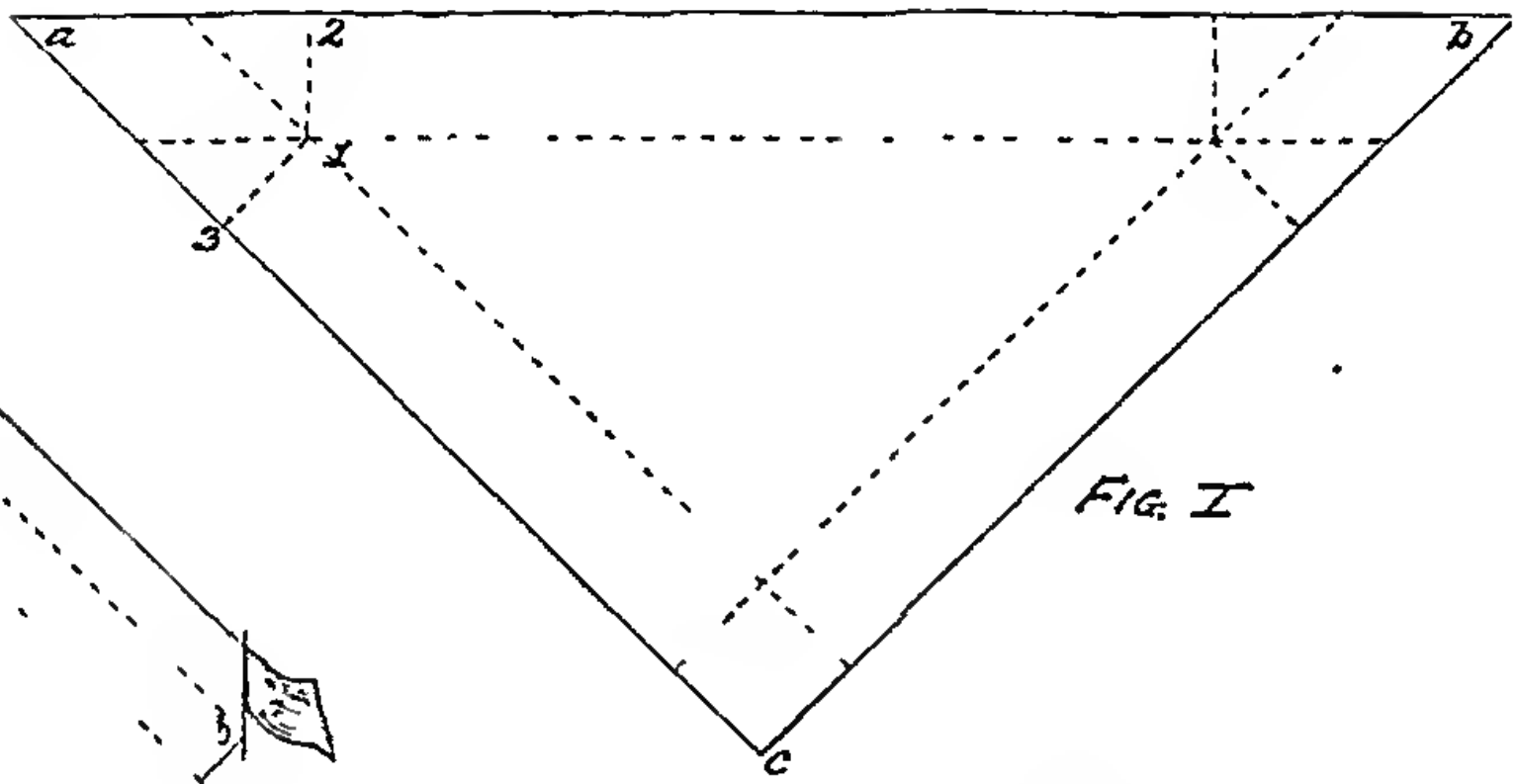


FIG. I

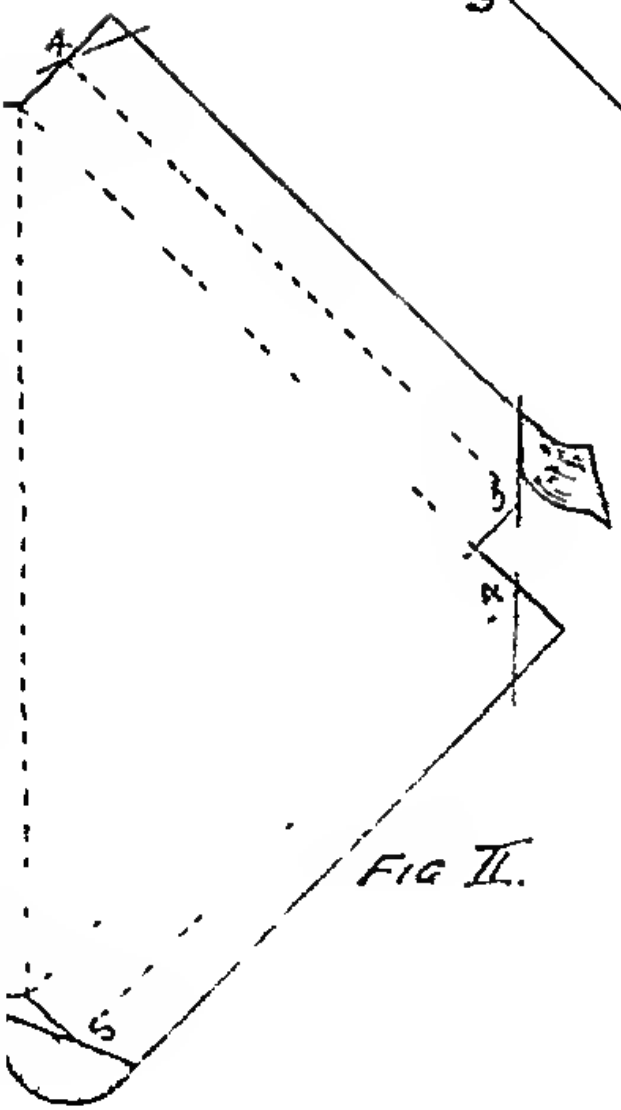


FIG II.

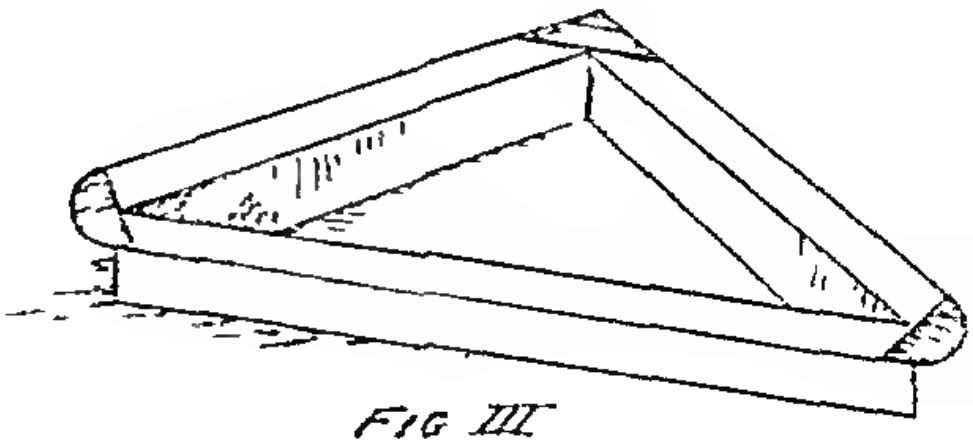


FIG III

V.—TO OBTAIN A SQUARE BY TEARING.

MATERIAL Tinted Paper

METHOD

1 Fold and crease firmly a small portion of the paper giving the line 1-2

2 Turn the paper over to get the convex side of the crease uppermost, and tear along 2-1. (Fig. 1.)

3 Place the paper as in Fig II, and fold corner 2 back upon the edge 1-2. Crease the line *a* 3, reverse the paper and tear along 3 *a*.

4. Place the edge *a* 1 on the zero line, and the edge *a* 3 along the top line of the Card Ruler. The length of side of the square of paper required, in this case five inches, determines the point *b*. (Fig. III.)

5 Fold corner 3 back on the line *a* 3, and crease down the five-inch line of the Card Ruler, thus obtaining the fold *b* 4.

6 Turn the paper over and tear the edge 4 *b*.

7. Fold the paper so that the edge *a b* is superimposed upon edge *a* 1, and crease *a c*. (Fig 4.)

8. Turn the paper over and fold forward the projecting edge 1-4, making *d c* coincide with *b c*. (Fig. V.)

9 Tear the edge *c d*, giving the square *a b c d* (Fig. VI.)

When the diagonal fold *a c* across the square is objectionable, the position of the last side of the square *c d* would be determined similarly to that of *b* 4, by measuring on the Card Ruler.

V.—TO OBTAIN A SQUARE BY TEARING.

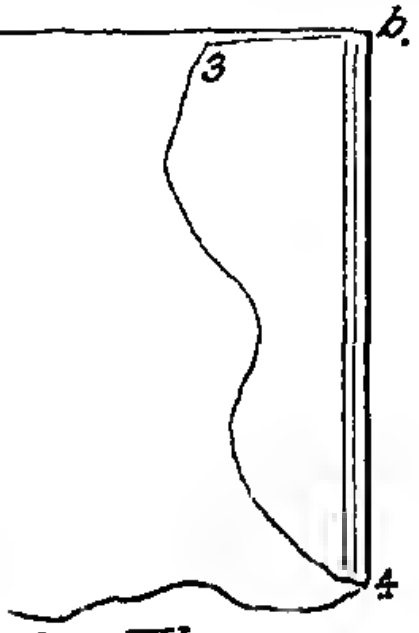


FIG III.

FIG I.

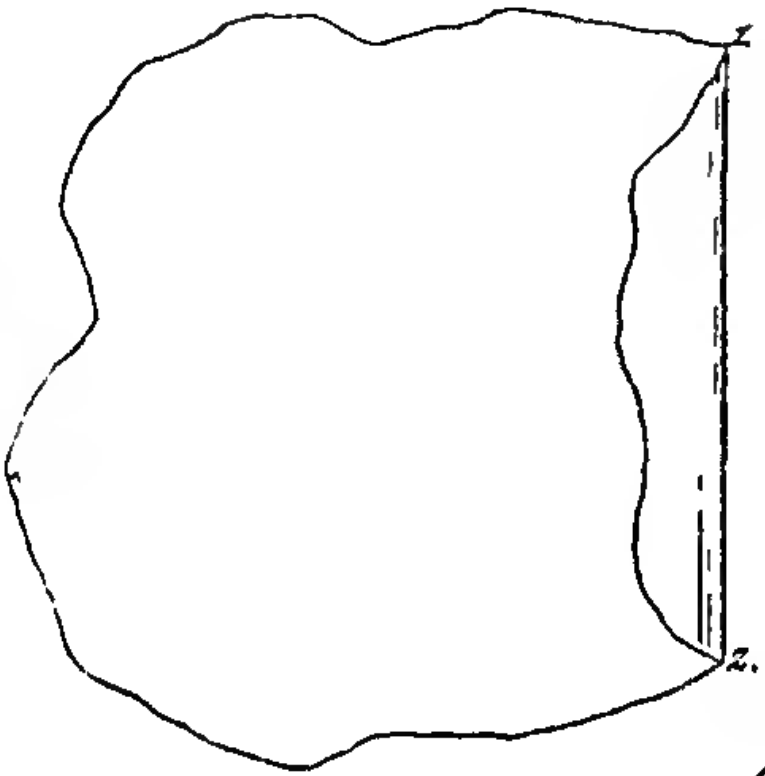


FIG II.

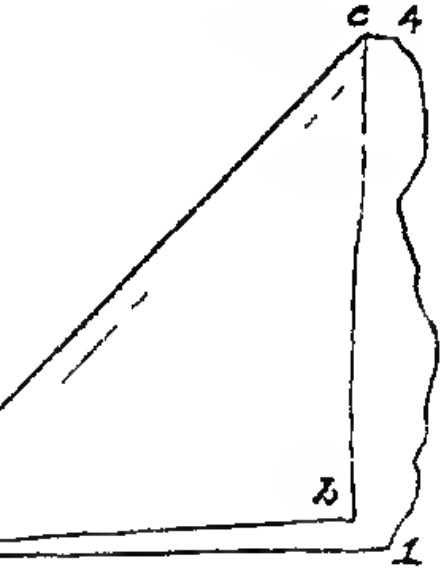
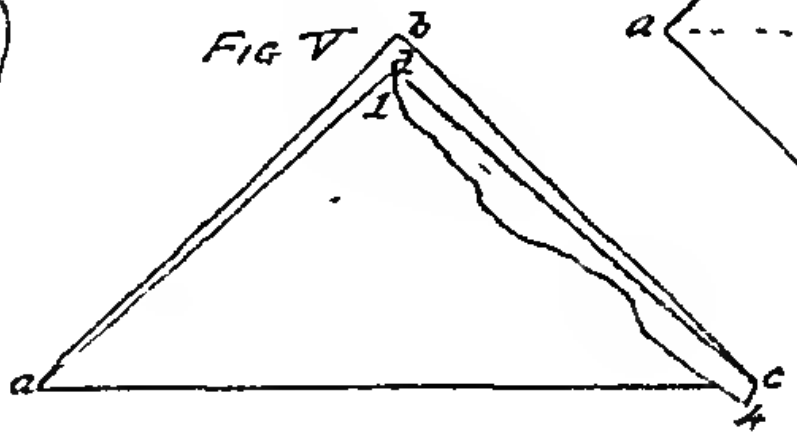


FIG IV.

FIG V



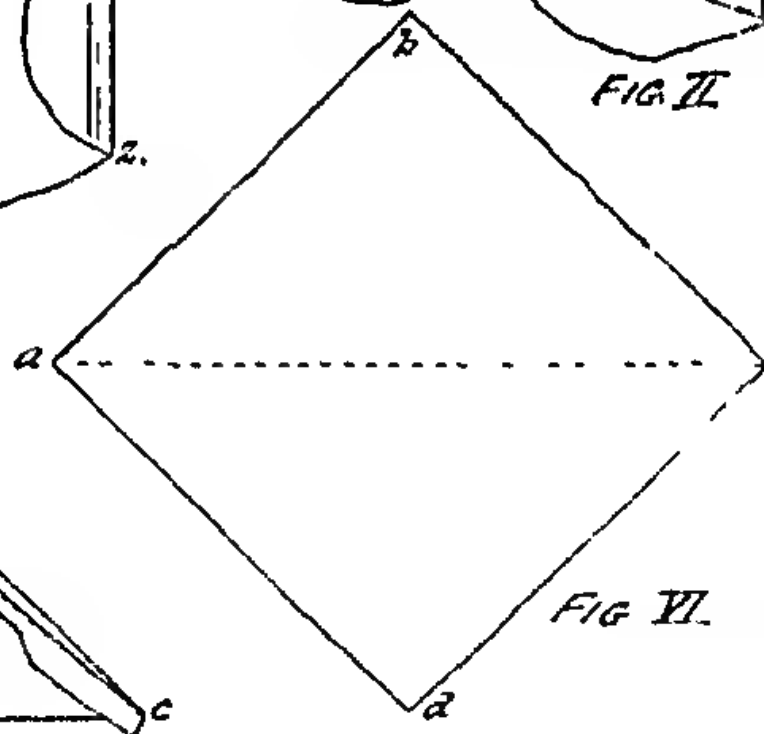


FIG VI.

VI.—DUAL POCKET.

MATERIAL The 5" Square previously torn, 2 Triangular Gummed Tickets

METHOD.

1. Lay the square on the desk with the convex side of the diagonal fold *a b* uppermost

2. Fold corner *b* over to *a*, and make a sharp dent with the forefinger as at *c*.

3 Pinch the diagonal fold at the corners *a* and *b* with the forefinger and thumb of both hands, and pull upwards towards each other as in Fig II., passing the corner *b* in front of the corresponding one at *a*. (Fig. III.)

4. Fold over to alternate sides the upstanding points, thereafter slipping them inside the central curve of the model

5 Fix with the two triangular tickets as shown in Fig. IV.

6 Thread a cord through the model below the edge of the gummed tickets

VI.—DUAL POCKET.

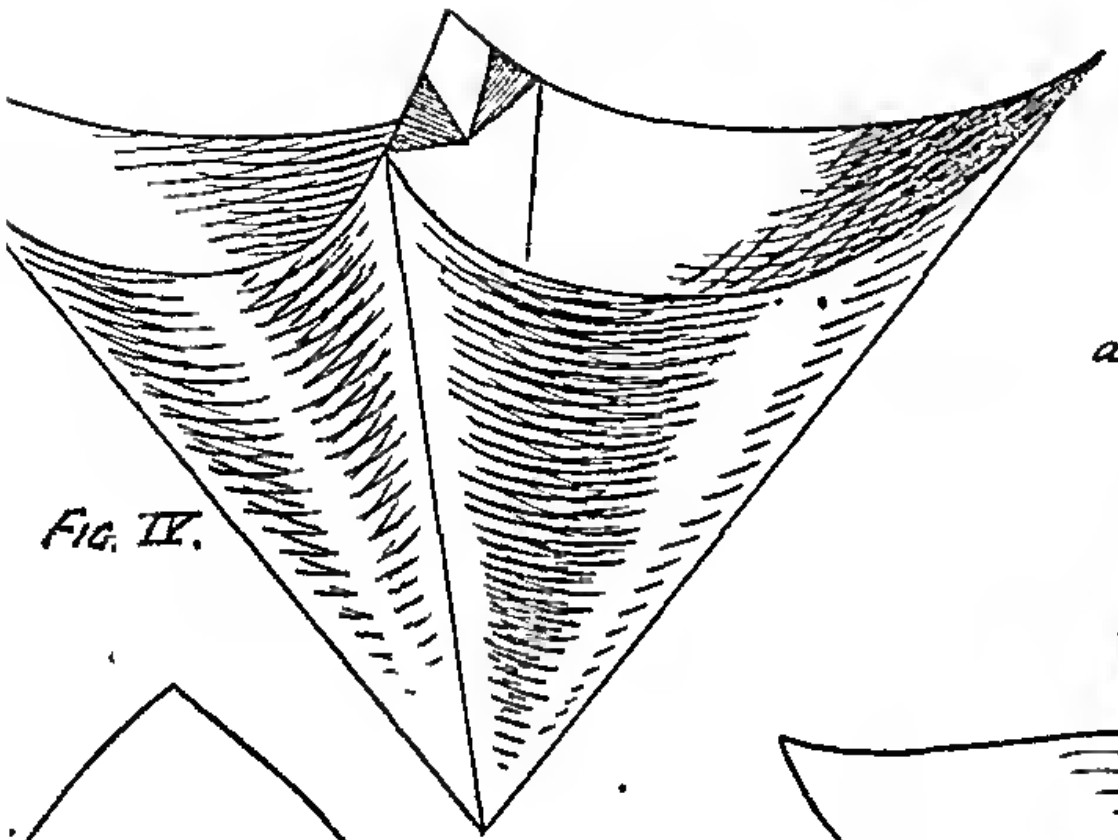


FIG. IV.

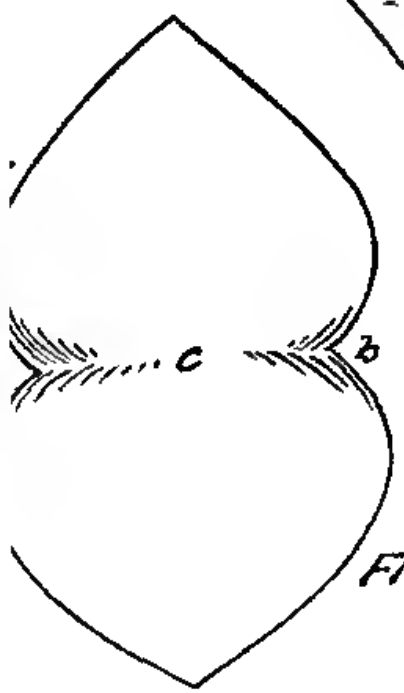


FIG. II.

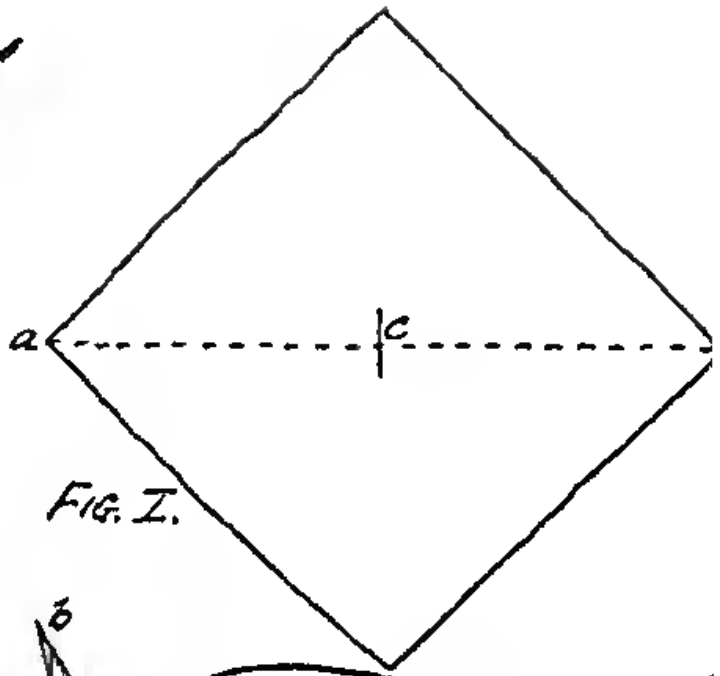


FIG. I.

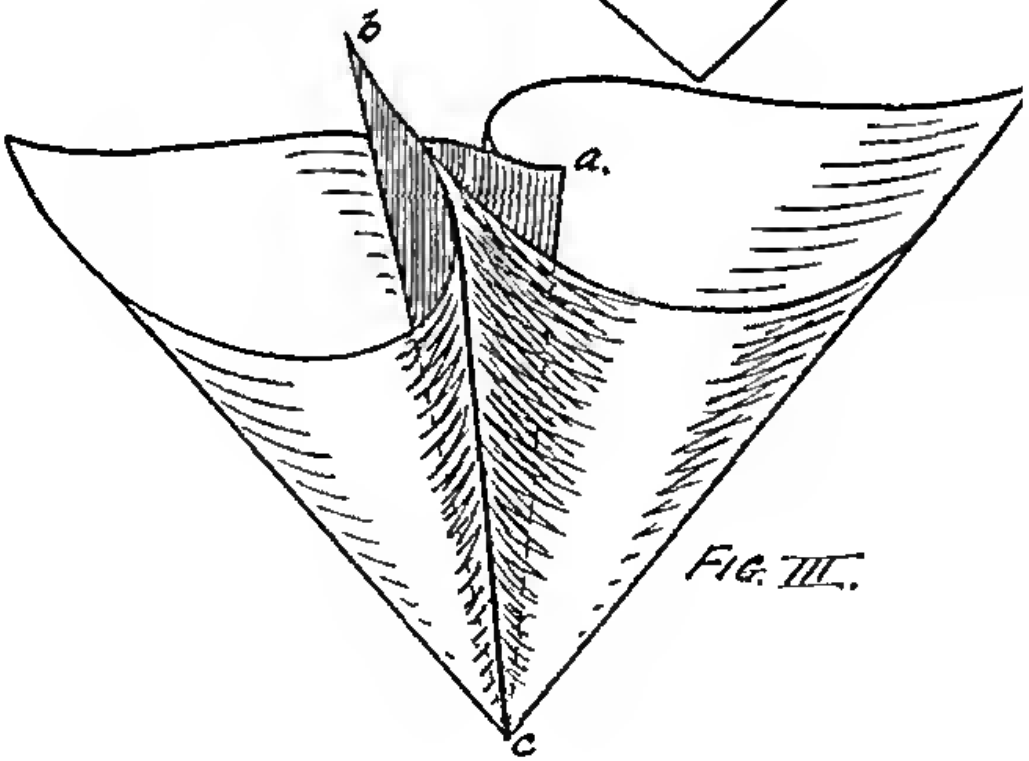


FIG. III.

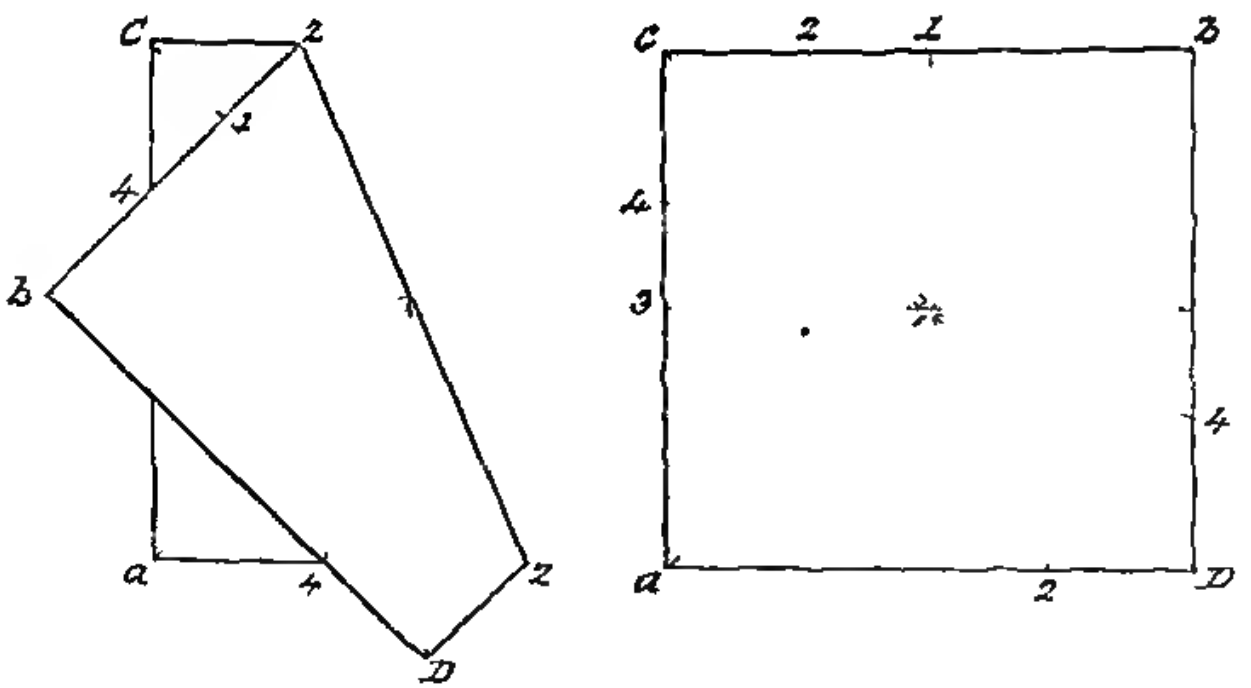
VII—ALTERNATIVE DESIGNS FOR DUAL POCKETS

MATERIAL Tinted Paper 2 Triangular Tickets

Figures I to V show some of the possible variations obtained by sub folding or varying the simple folds used for the previous model The large variety of lines possible from this process of folding make the models so constructed valuable as individual drawing studies

When made from various tints of paper they are attractive receptacles for sweets and may be utilised at Xmas or other festive occasions The development of Fig III is given below the others being left to the effort and ingenuity of the pupil

DEVELOPMENT OF FIG III



VII.—ALTERNATIVE DESIGNS FOR DUAL POCKETS.

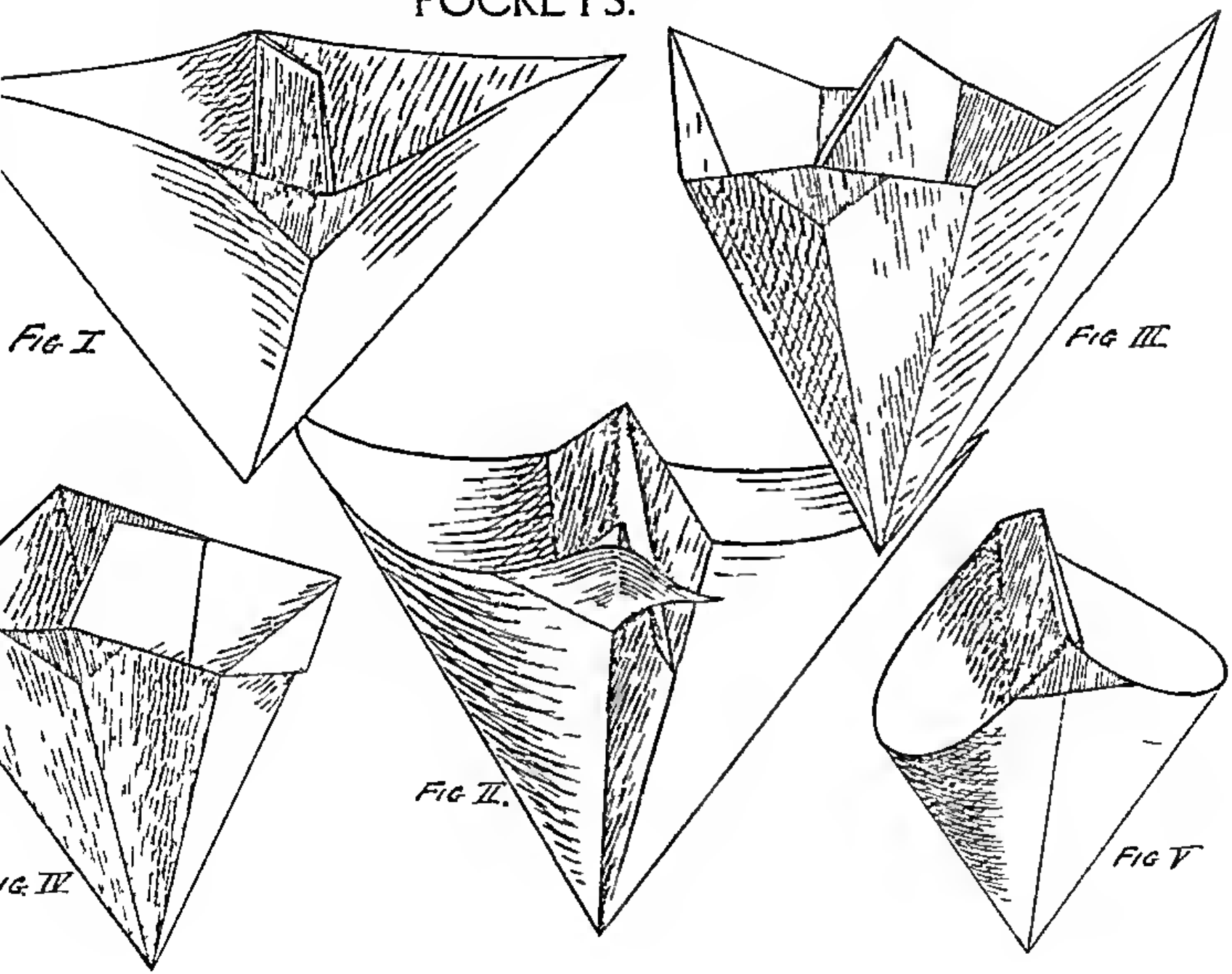


FIG I

FIG III

FIG II.

IG. IV

FIG V

VIII.—CIRCULAR TRAY.

MATERIAL. Tinted Paper, Four $\frac{3}{4}$" Square Gummed Tickets

METHOD.

1. Tear the paper supplied to a square of 4" side.
2. Mark with pencil the centre, using the metal edge of the card ruler along the diagonals of the square
3. Indicate in pencil the centre points of the sides, points 1 and 3 being marked on the upper side of the paper, and 2 and 4 on the lower side. (Fig. I.)
4. Fold over to the centre point, in order, the corners *a*, *b*, *c*, *d*, indicating with the point of the finger the position of 5, 6, 7, 8. (Fig. I.)
5. Fold corner *a* over to coincide with corner *d*, and crease outwards from 6 and 8.
6. Repeat to obtain similar creases from 5 and 7.
7. Tear along the four creases thus made using the special method given for diagonal tearing. (Page 16, Part I.)
8. Take the four gummed tickets, crease one diagonal of each, and attach as shown, two to the lower, and two to the upper side of the paper. (Fig I.)
9. Fasten the model together, a' and b' meeting at the point 1, on the inside of the model.
10. Moisten the upstanding half of the ticket and fix down.
11. Carry over c' and d' to point 3, also on the inside of the model and fix as before.
12. The remaining corners *a*, *b*, *c*, *d* are similarly treated but on the outside of the model. (Fig. II.)

Fig. III. shows an alternative design somewhat simpler in construction. A still more elementary form is obtained by creasing the square 5, 6, 7, 8, and then creasing from these corners to points 1, 2, 3, 4. This method allows of the tickets being fixed while the model lies flat

VIII.—CIRCULAR TRAY.

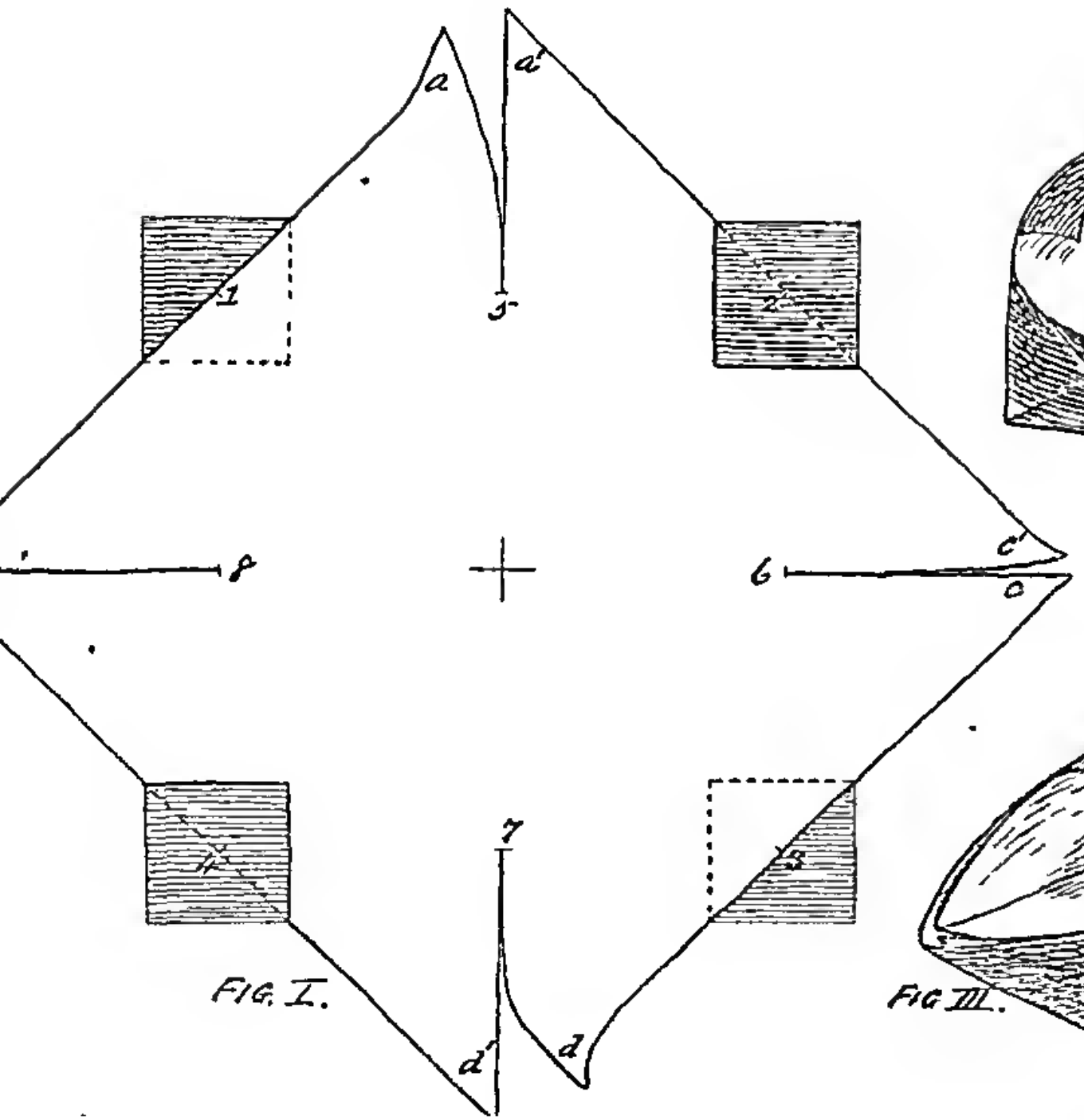


FIG. I.

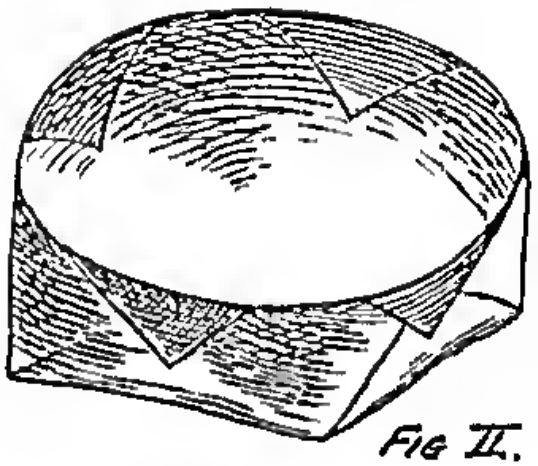


FIG II.

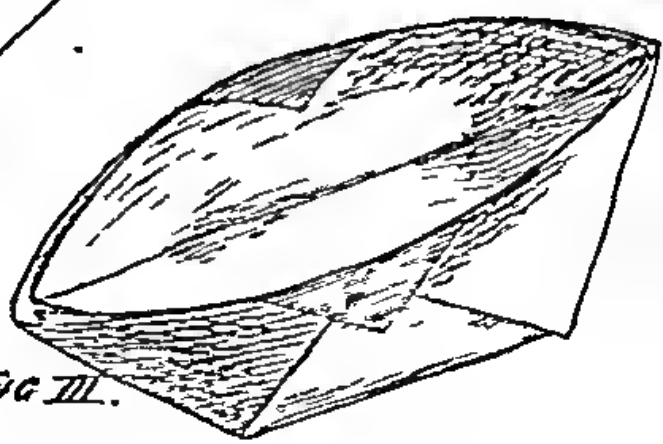


FIG III.

IX.—LID FOR SQUARE BOX.

MATERIAL: Tinted Paper, One 1" Square Gummed Ticket

METHOD.

1 Fold and crease the paper into two equal parts, folding along the shorter diameter.

2 Utilising these torn edges, prepare by folding and tearing, two squares, one of 5" side, and the other of $5\frac{1}{4}$" side.

3 Draw light pencil lines (using the card ruler) along the diagonals of the larger square.

4. Fold to the centre, the four corners of the paper, creasing the lines which form the square 1, 2, 4, 3. (Fig. I.)

5. Fold corner *a* forward to touch the penciled diagonal where it crosses the line 1-3, and also to the point where the diagonal crosses the line 2-4. Crease firmly the two folds thus formed.

6. Repeat with the other three corners of the square thus obtaining the folds as shown in Fig. I.

7. Turn the paper over, and crease one diagonal of each of the four small squares at 1, 2, 3, 4. (Fig. II.)

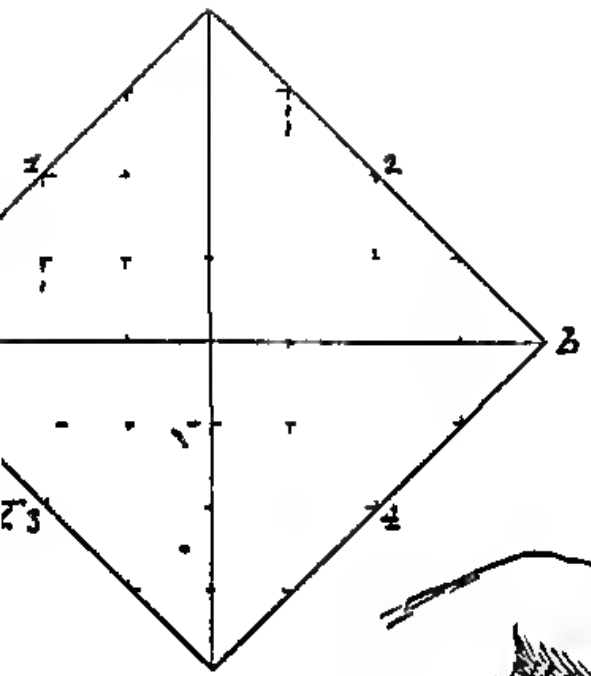
8. Turn the paper and fold the two corners of the square *a* and *b* to the centre, pushing the convex folds 1 and 2 inward with the forefingers as shown in Fig. III.

9 Push the corners 1 and 2 close against the inside of the box, and fold forward and downward to *a b* the upstanding corner. (Fig. IV.)

10. Proceed in a similar manner with the other end.

11. The triangular parts on the inside may be secured with a square gummed ticket.

IX—LID FOR SQUARE BOX



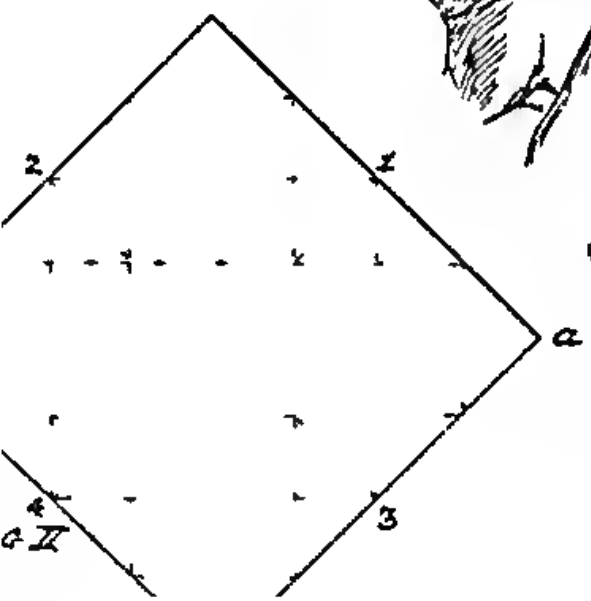


Fig III.

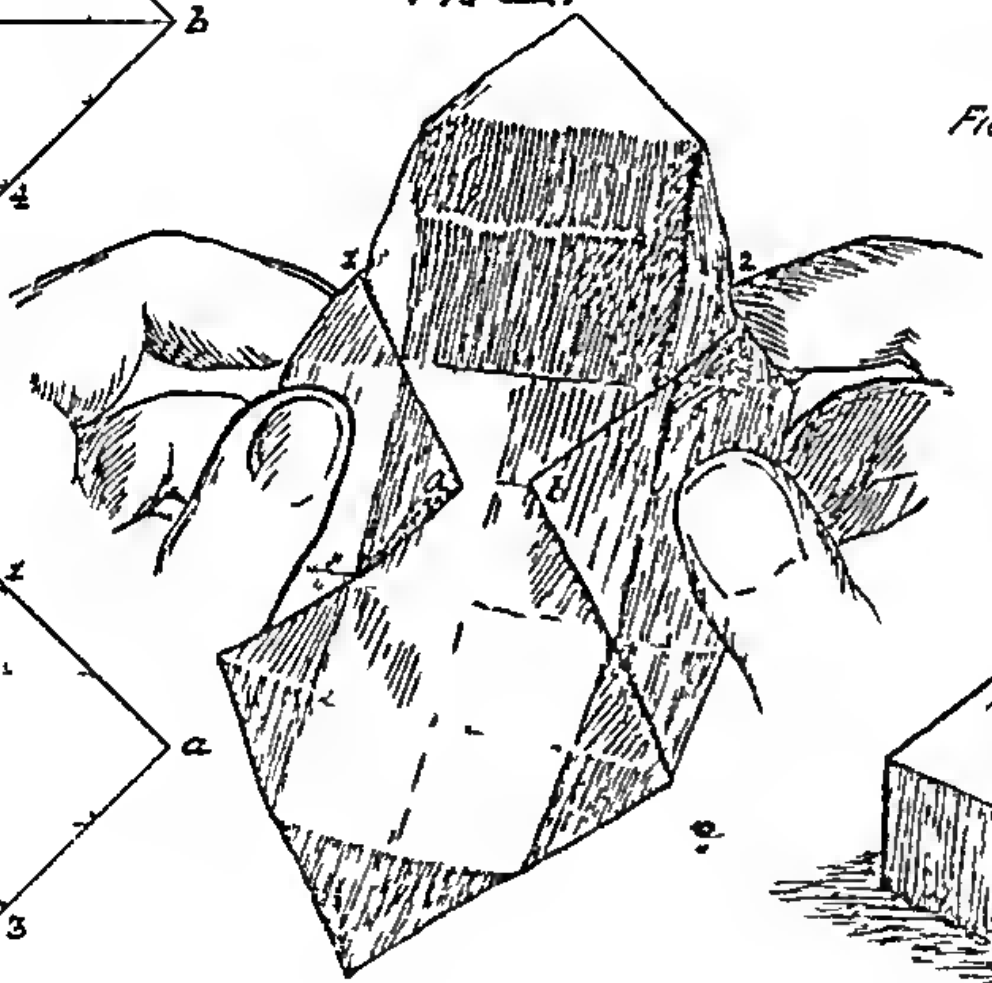
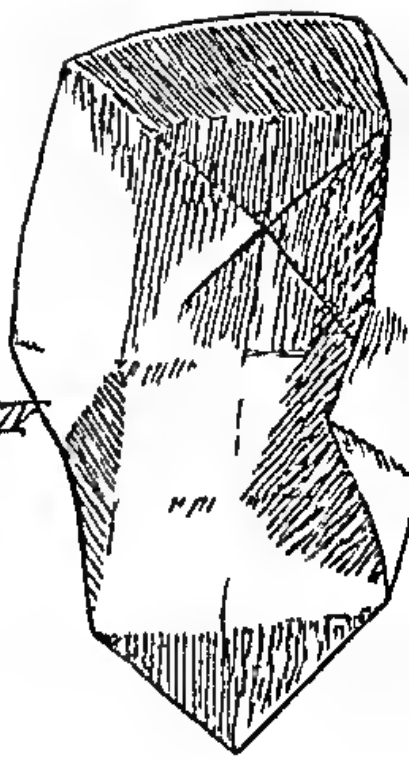


Fig IV.



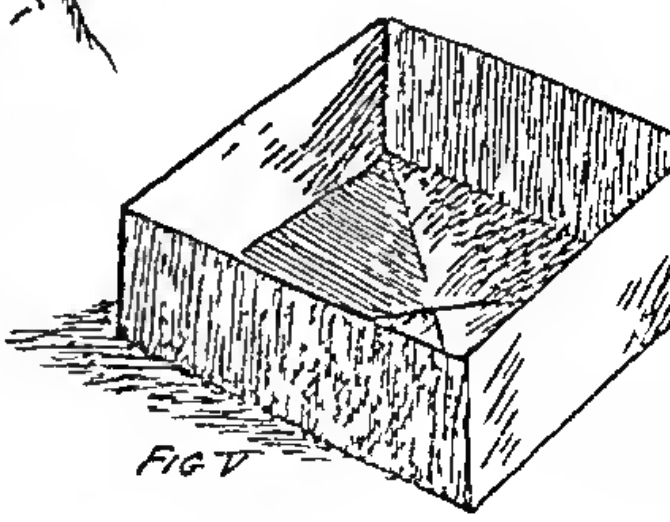


Fig V

X—SQUARE BOX—ALTERNATIVE DESIGNS

MATERIAL 5" Square previously torn One 1" Gummed Square or I our $\frac{11}{16}$" Gummed S juares

METHOD

1 Fold the square as for the previous model the lines of the small square 5 6 7 8 (Fig I) of this plate should be convex as well as the short diagonals 1, 2 3 4 (Fig II Plate IX)

2 Fold the two corners of the square *a* and *b* to the centre as in previous model

3 Fold backward from the operator the sides of the box pushing the corners 1 2 close down on the outside of the box

4 Fold towards the operator the upstanding corner

5 Repeat with the other end and secure the four loose triangular parts to the base of the box with a gummed ticket (Fig II) Note—This method gives a smooth interior and is most suitable where a nest of boxes as in Fig II is desired When making a nest of boxes the size of side of the square must be reduced for each smaller box by one quarter of an inch

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The box in Fig III provides an alternative to the above and is more decorative than the former when used singly with a lid The corners of the box are secured with four square gummed tickets and the free triangular parts turned outward to form a projecting base This base might be mounted by smart pupils on a square of stout paper or cardboard

The box and lid can be made collapsible as shown in Fig IV by adding to the square of paper already folded the folds 5 6 7 8 (Fig I) Where the nest type of box is not desired this method facilitates the storage of the work It should be observed that these supplementary folds always cross the diagonal *a b* as these are the sides of the box with the fewest thicknesses of paper When putting the lid on the box the thick and thin sides should alternate Attention to this point will ensure the squareness of the model being retained which is always a difficulty with collapsible models

X.—SQUARE BOX—ALTERNATIVE DESIGNS.

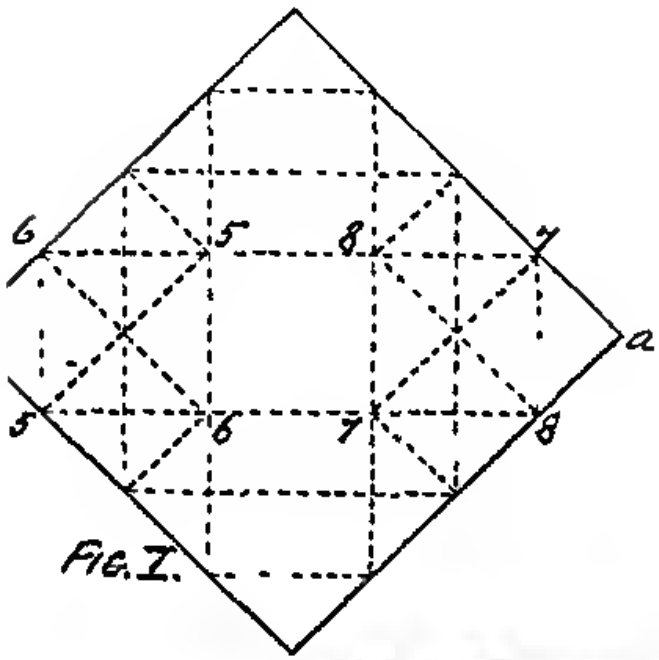


FIG. I.

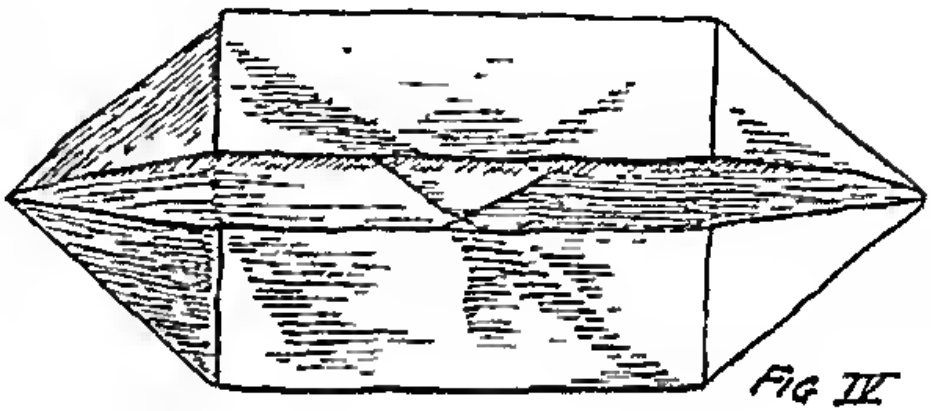


FIG IV

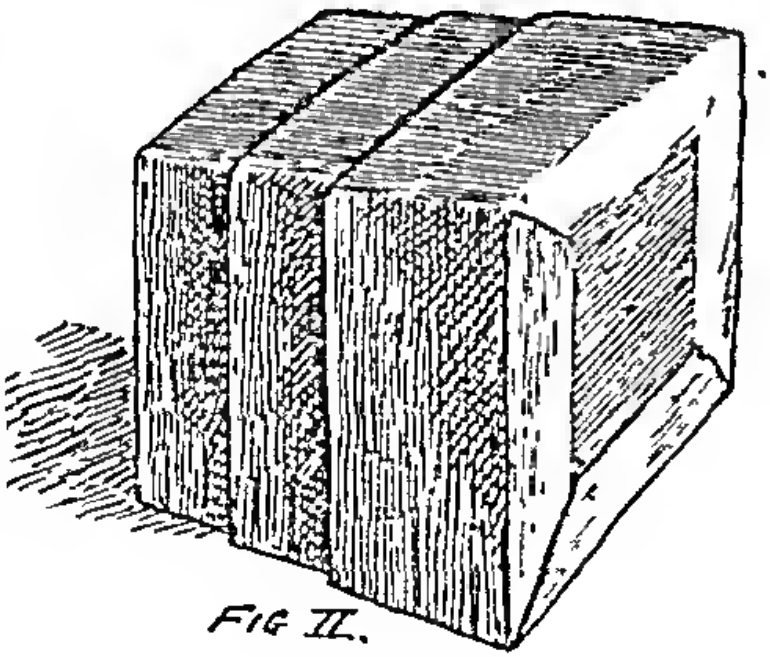


FIG II.

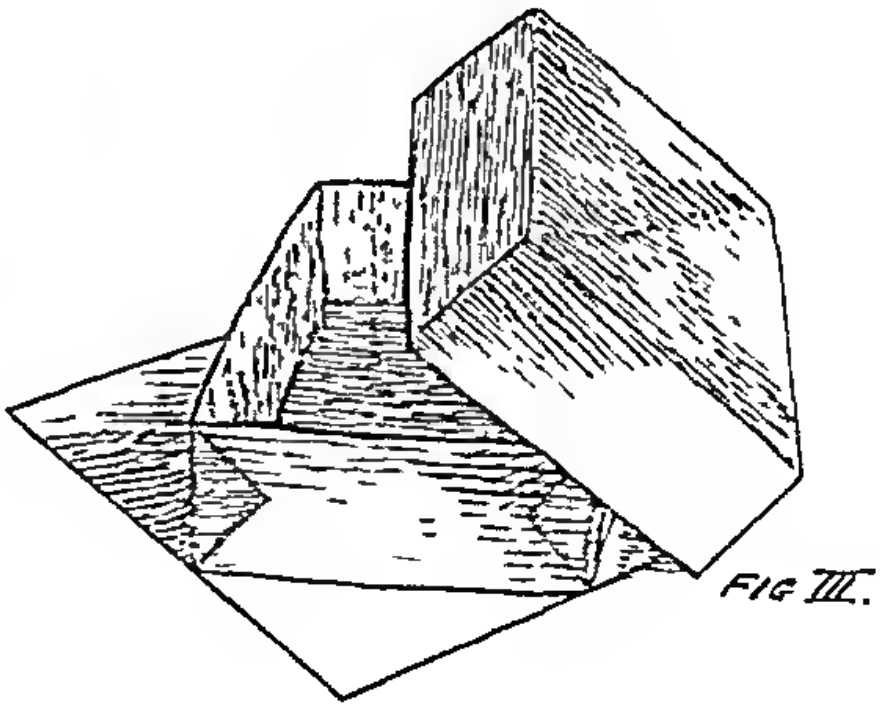


FIG III.

XI—WALLPOCKET—BOAT—SHIP

MATERIAL Tinted Paper

METHOD

WALLPOCKET.

1 Tear an oblong 6″ × 5 Measure and draw—lightly in pencil on one side of the paper—two diameters *a b* 5 long and *c d* 6″ long both lines passing through the centre of the paper Fold along *a b* keeping the pencil lines to the outside (Fig I)

2 Fold corners *a* and *b* backward and forward respectively against the line *c d* (Fig II)

3 Fold upwards close to *a b*, the lower projecting edges (Fig III)

4 Turn in the four corners as at *e* (Fig III)

5 Take the model between the forefinger and thumb of the hands at *a* and at *b*, and pull outward thus obtaining the form Fig IV

6 Approach corner 1 to corner 2 and fold a little above the corners *a* and *b*

7 Reverse this fold turning triangle *a* 1 *b* backward into the inside of the pocket. (Fig V)

BOAT

Stages 1 to 5 as for Wallpocket

6 Fold corner 1 forward and downward to coincide with corner 2 (Fig IV)

7 Repeat with upstanding corner 3 folding backward giving Fig VI

8 Grip at centre of sides *a b* and pull outward (Fig VII)

9 To obtain the boat shape pull corners 1 and 3 outwards (Fig VIII)

SHIP

Stages 1 to 5 as for Wallpocket

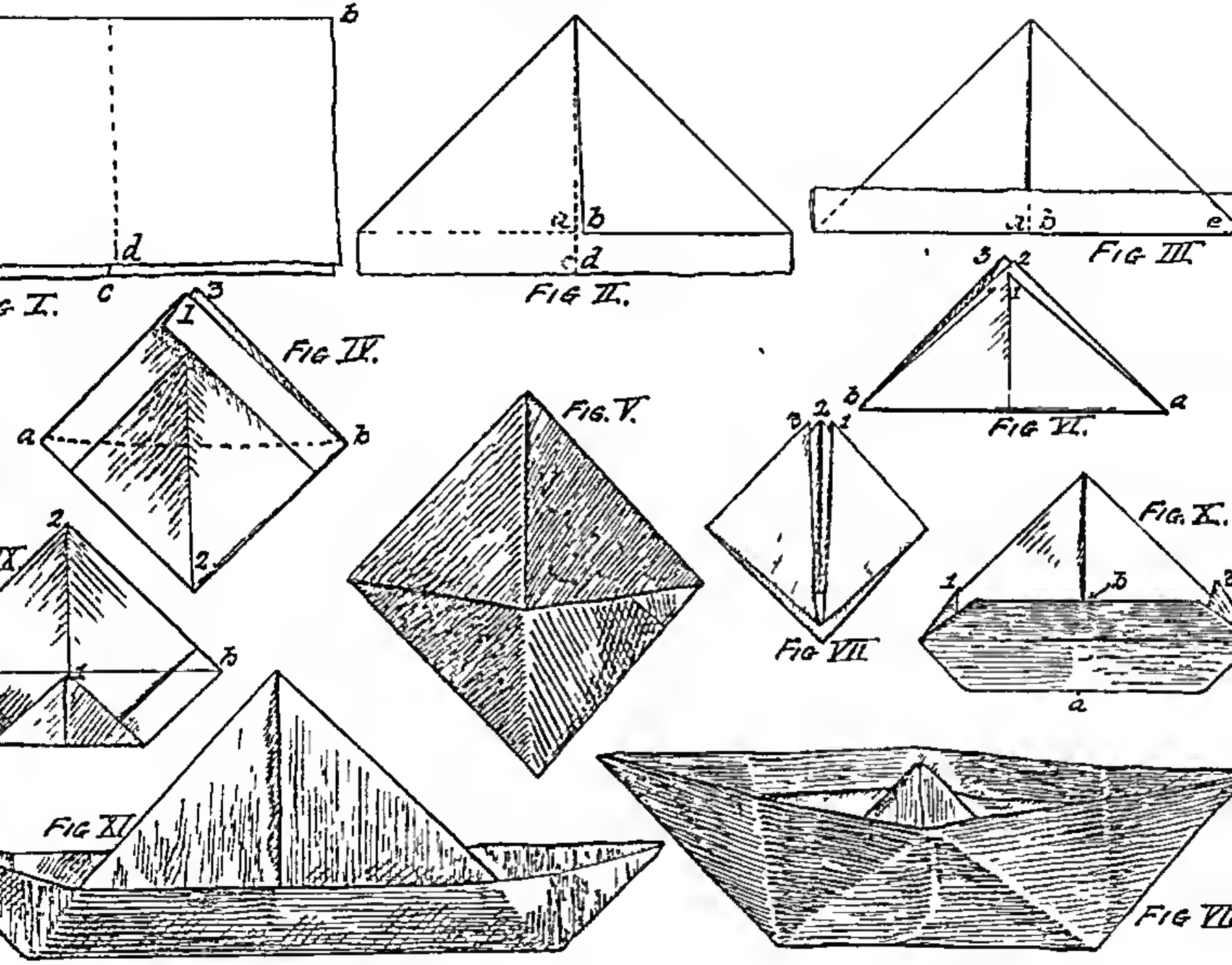
6 Rule a light pencil line through *a b* and fold corners 1 and 3 which lies behind 1, upward to meet this line at the centre (Fig IX)

7 Take hold of the triangles 1 and 3 and pull outwards, this will give a shape similar to the outline of Fig X

8 Fig X shows the free edge *b* turned upwards as far as possible Repeat with *a* folding backwards

9 Pull corners 1 and 3 outwards giving the ship Fig XI

XI.—WALLPOCKET—BOAT—SHIP.



XII—CORNER SHELVES.

MATERIAL Tinted Paper

METHOD

1 Tear a rectangle 6′ × 4½′ Fold and crease as in Fig I

2 Fold the end units of the lines 1 2 and 3 4 backward to form convex creases on these parts

3 Arrange the folds as in Fig II

4 Insert corner *a* within opposite corner *b*, and *d* within opposite corner *c* (Fig III)

5 Push these triangular parts closely into each other and pinch the edges and corners of the model to produce sharpness of outline (Fig IV)

If the children under instruction find it too difficult to insert simultaneously the corners *a* and *d*, which are on opposite sides of the model, the corners *a* and *c* can be inserted within *b* and *d* instead A model constructed in this way is, however, more liable to come apart

XII.—CORNER SHELVES.

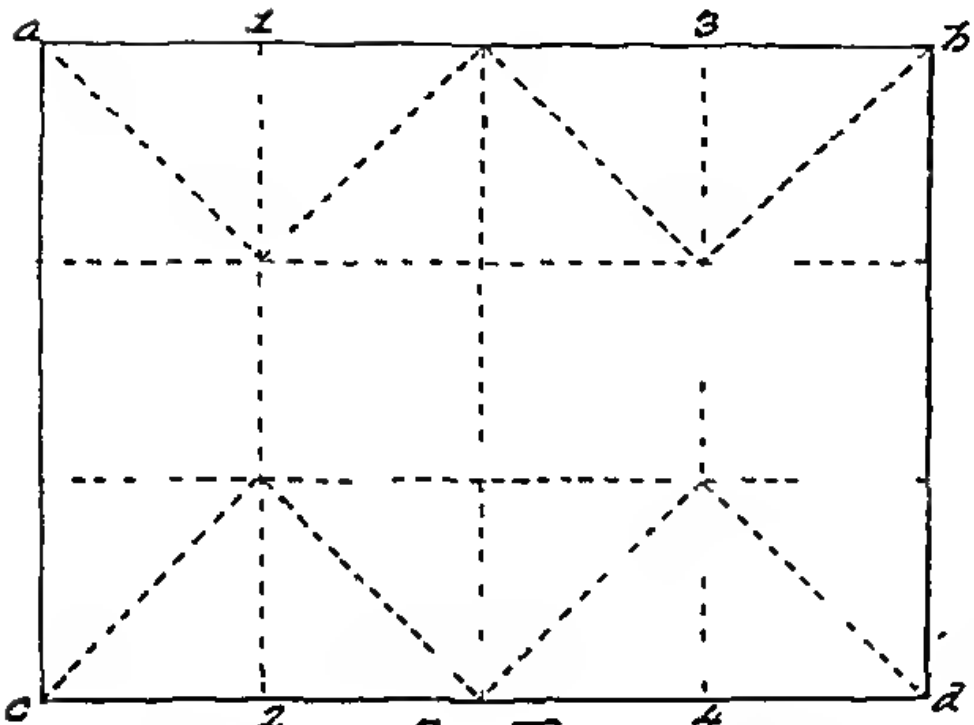


FIG I

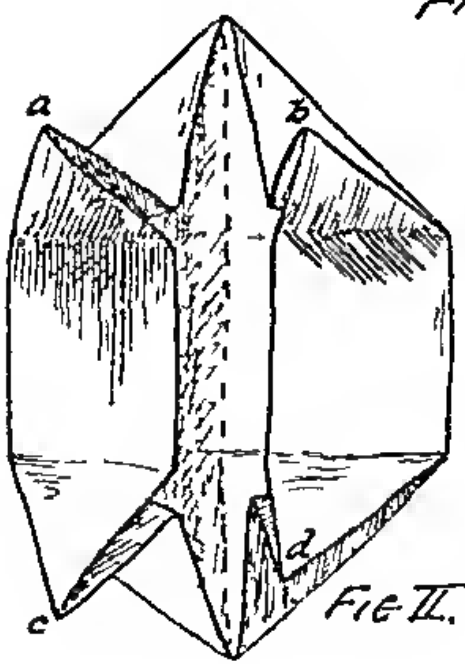


FIG II.

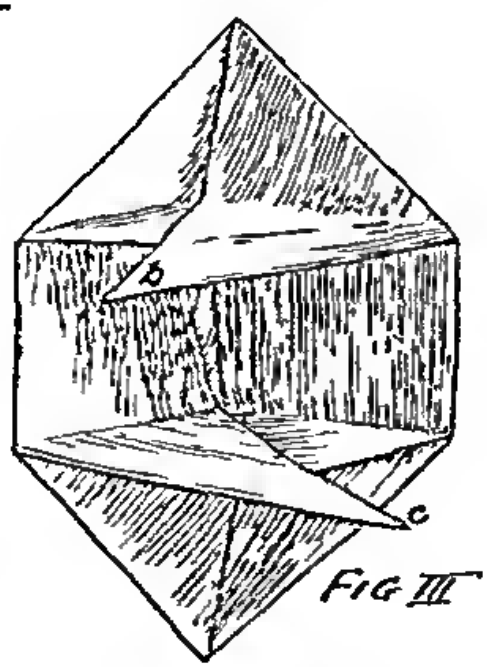


FIG III

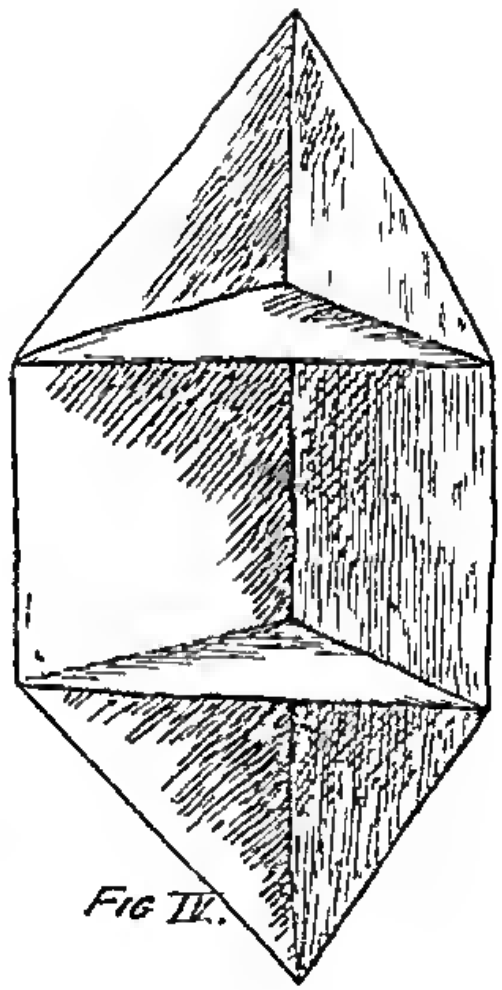


FIG IV.

XIII.—BUSINESS ENVELOPE.

MATERIAL Tinted Paper, One 1" Gummed Disc.

METHOD

1 Measure and mark the centre points *a*, *b*, *c*, *d* on the four edges of the cut material

2 Fold and crease firmly between the points *b a*, *b d*, and *c a*, *c d* (Fig I)

3 Tear along the creased lines, and start the tearing in each case from points *b* or *c*, using special method (See pp 16, 17, Part I)

4 Mark with pencil—using the card ruler—the centre of the rhombus

5 Apply the dimensioned edge of the card ruler to the paper, and mark points 1 and 2, one quarter inch to right and left of centre vertical line (Fig II)

6 Fold corner *c* over to coincide with point 1 (Fig III), crease, and lay out flat again

7 Fold corner *b* over to coincide with point 2 and crease

8 Bring corner *c* back again into position, and fold corner *d* upward to the point where edges *a c* and *a b* intersect (Fig IV)

9 Fold corner *d* out flat and repeat with corner *a*

10 Turn corner *a* outward and *d* inward and attach gummed disc (Fig V)

XIII.—BUSINESS ENVELOPE.

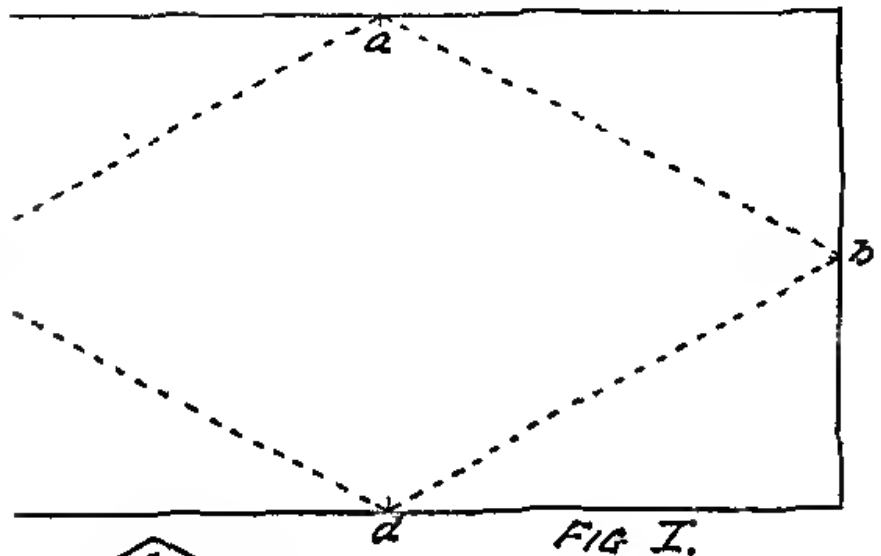


FIG I.

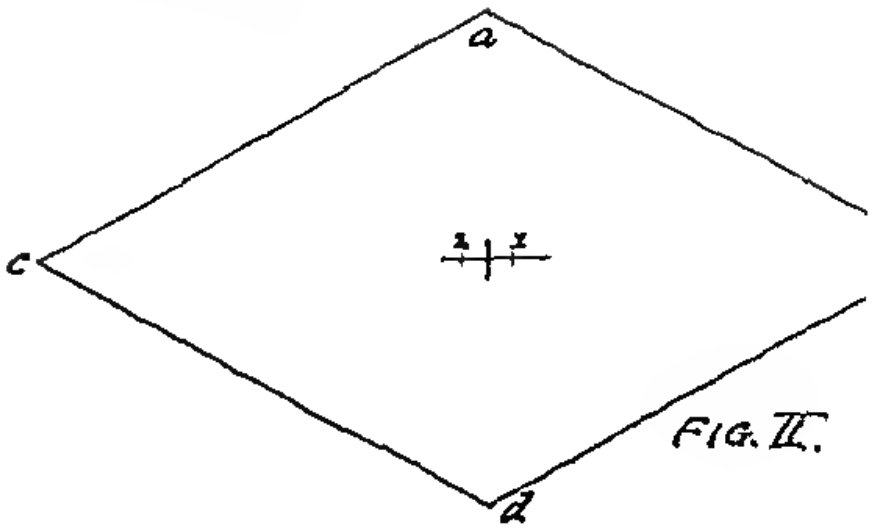


FIG. II.

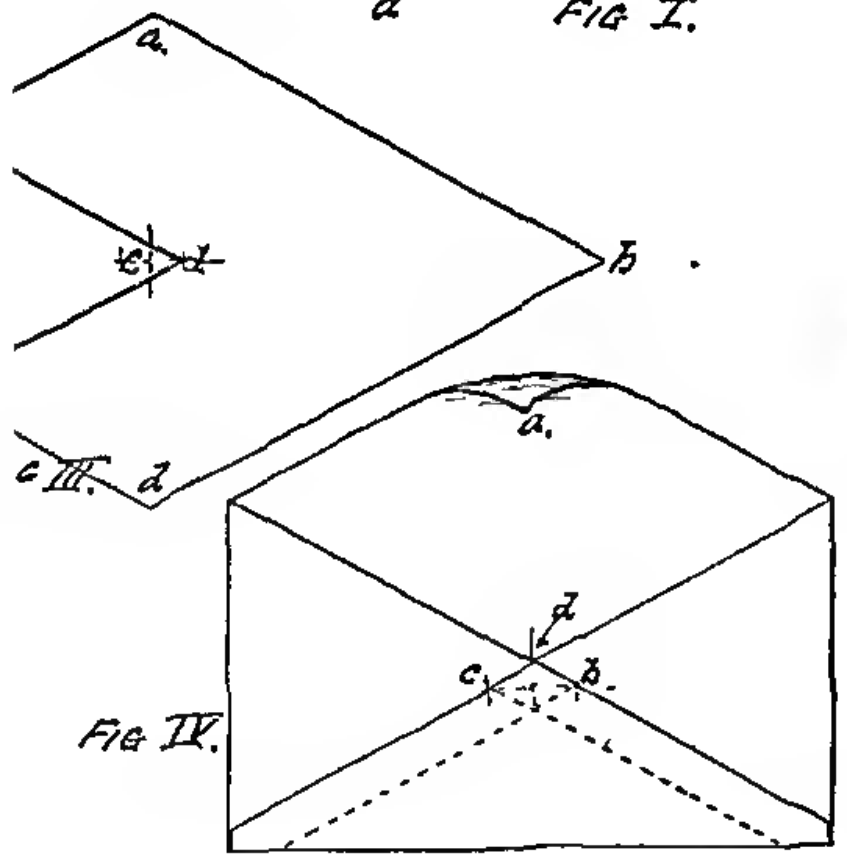


FIG III.

FIG IV.

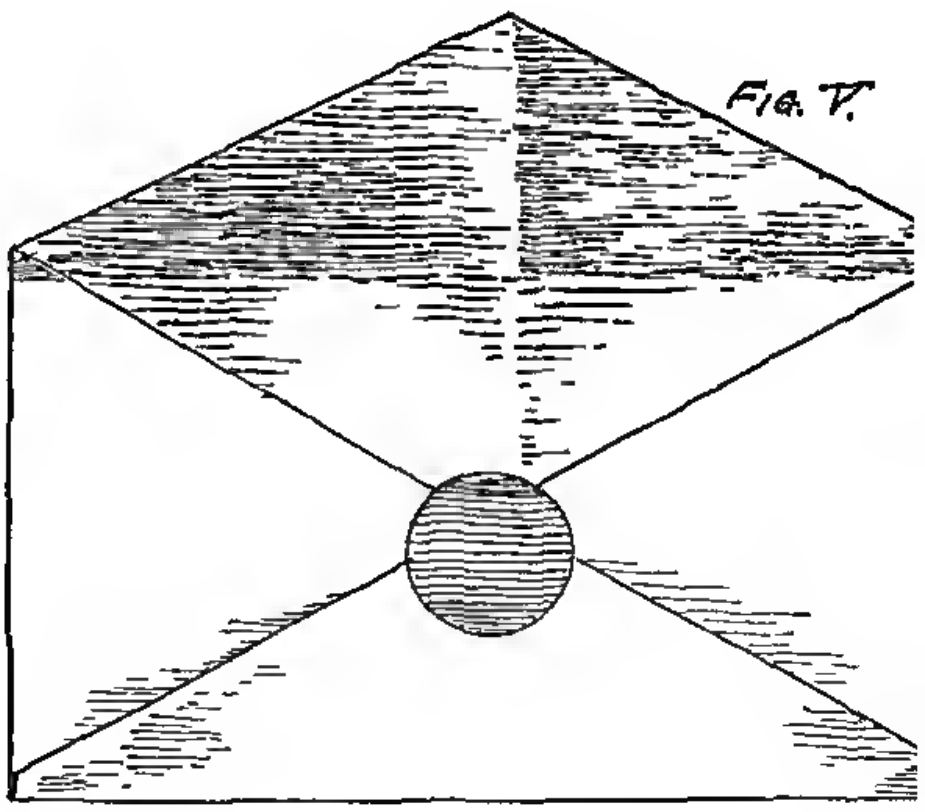


FIG. V.

XIV —CORNER CUPBOARD.

Material Tinted Paper Six ¾ Square Gummed Tickets

Method

1 Obtain two squares of six inch side by tearing and reserve one for Model No XV

2 Divide the square into four equal parts with the three vertical folds and crease

3 Use the card ruler to bisect the edges *a c* and *b d*

4 Fold *a b* and *c d* forward to these points Crease firmly the horizontal folds 1 2 and 3 4 thus obtained

5 Crease the four diagonal lines from *e* and *f*

6 Apply the edge of the card ruler to get the centre of the end units of the lines 1 2 and 3 4

7 Tear these lines down to the points just marked and fold inward to the adjacent vertical folds the large units 1 3 and 2 4

8 Rule four short pencil lines in continuation of the folds last made turn the triangular corners over to coincide with these lines and crease as at *g* (Fig I)

9 Tear out the four triangles

10 Fold to the form in Fig II and attach the gummed squares

Freedom should be allowed pupils to utilize the gummed tickets supplied to fasten and decorate the model according to their own ideas

XIV.—CORNER CUPBOARD.

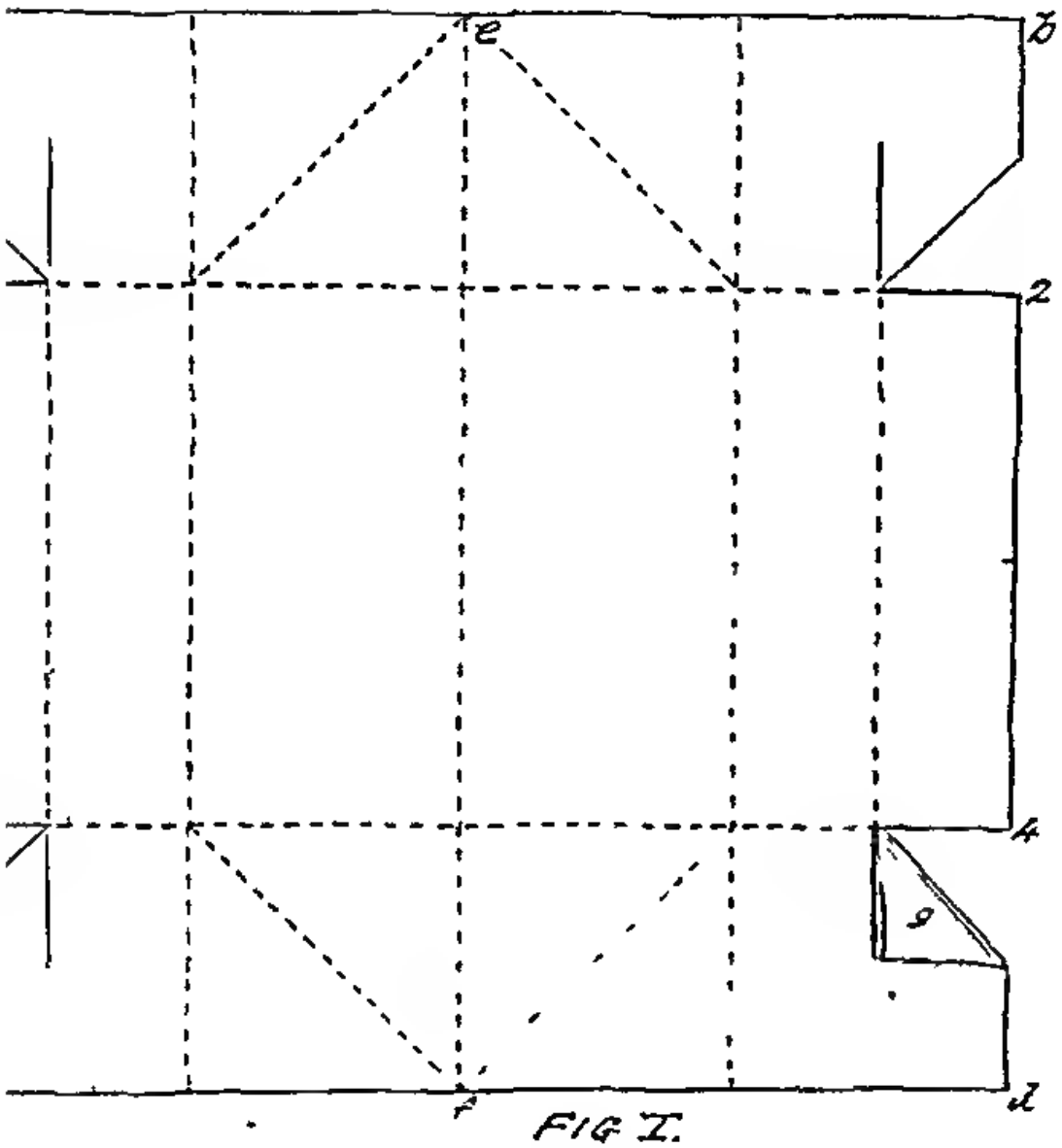


FIG I.

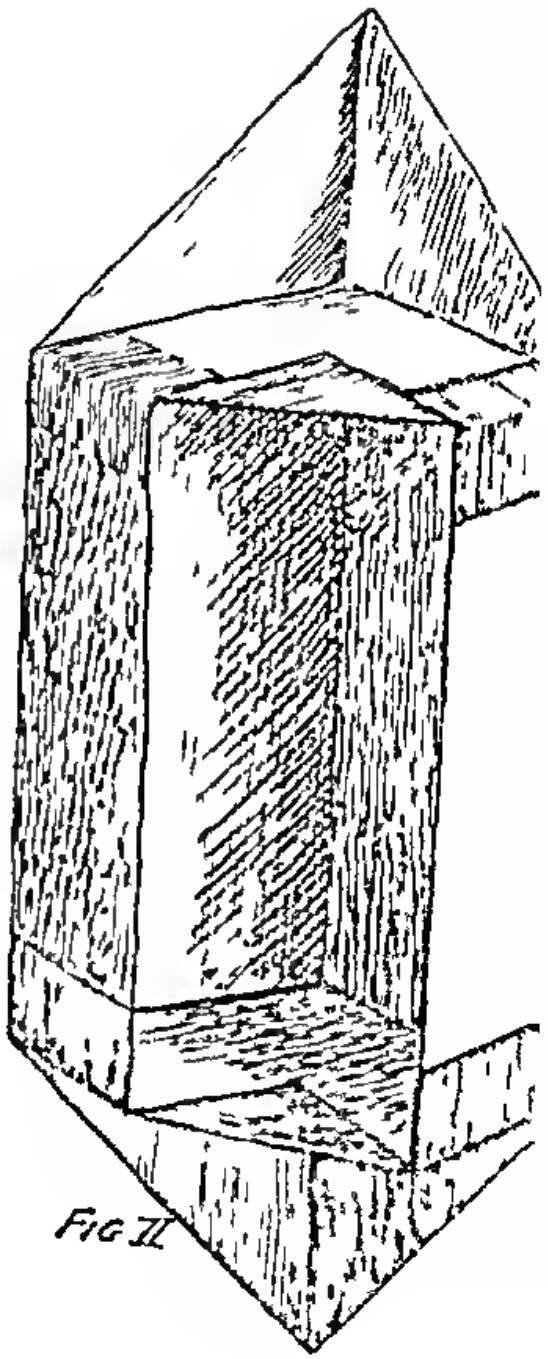


FIG II.

XV.—ALTERNATIVE DESIGNS BASED ON Nos XII. AND XIV.

TRIPLE CORNER SHELF (Fig I)

MATERIAL Torn Square, 6″ side, One Square Gummed Ticket

METHOD

The process of construction for this model is similar to that for No XII The squares at *a* and *b* are of single thickness the material thus obtained is folded inward to form the centre shelf, the loose back corner of which is fastened with a gummed ticket

BOOK REST (Fig II)

MATERIAL Torn Square, 6″ side

In construction this model also resembles No XII The points of difference being *(a)* the double unit forming the body of the model has no transverse fold across the centre, *(b)* the projecting triangular ends are turned inwards

CORNER CABINET (Fig III)

MATERIAL Torn Square, 6″ side, One Square Gummed Ticket

In making this model the two centre diagonal lines at the upper edge of Fig I, Plate XII, are omitted, while the top unit of the vertical lines 1 and 3 are torn, and the large centre part, 1 3 folded downwards, to obtain the ledging shown on top of this model A gummed ticket is necessary to secure the upper shelf

OBLONG BOX (Fig IV)

MATERIAL Torn Oblong, 6″ × 4½″, Two Square Gummed Tickets

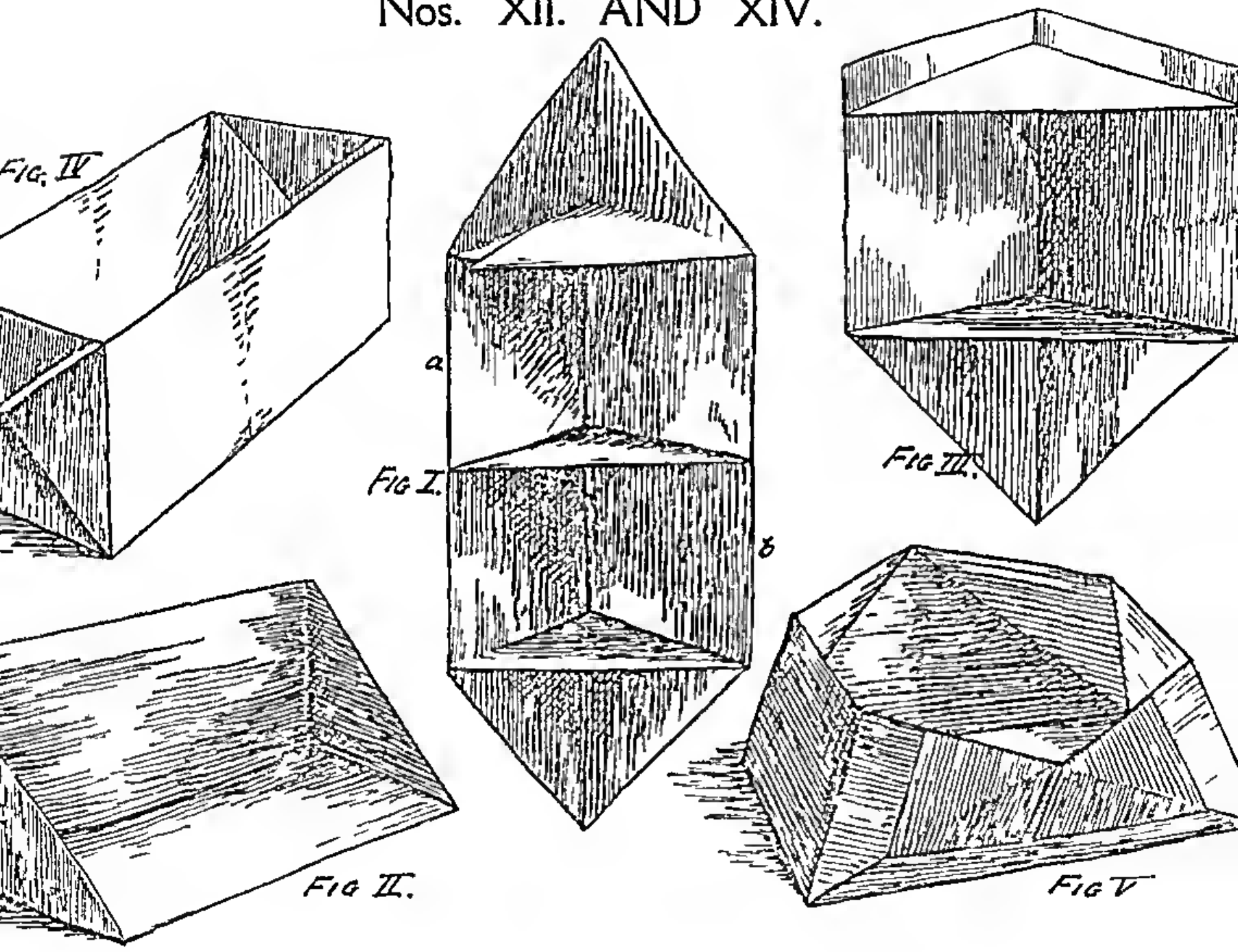
In folding for the development of this model, omit all folds from the rectangle 1, 2, 4, 3, except the two horizontal folds (Fig I, Plate XII)

HEXAGONAL TRAY WITH RECTANGULAR BASE (Fig V)

MATERIAL Torn Oblong, 6″ × 4½″, Four Square Gummed Tickets

For this tray, omit the centre vertical fold, and remove by tearing the two triangular parts on *a b* and the two on *c d*, which go to form the shelves (Fig I, Plate XII) The tickets should be creased firmly along one diagonal before being attached to the model

XV.—ALTERNATIVE DESIGNS BASED ON Nos. XII. AND XIV.



XVI.—TRIANGULAR CONFECTION DISH.

MATERIAL Tinted Paper, Three Square Gummed Tickets

(To obtain by tearing an Equilateral Triangle of $7\frac{1}{2}$" side)

METHOD

1. Fold in a small part along one of the 8" sides Crease and tear off
2. Bisect this torn edge by folding along *a b*
3. From *b*, set off a distance equal to half the length of the side of the triangle, viz., $3\frac{3}{4}$".
4. Tear off the corners to this mark, open out the paper, and the base of the triangle *c d*. $7\frac{1}{2}$" long should result. (Fig. I.)
5. Using *c* as a pivot fold the edge *c d* over until the point *d* falls on the line *a b* and crease *c e* (Fig. II.)
6. Fold backward to coincide with *c d* the part marked *x*. Crease and tear off this portion. (Fig. II.)
7. Mark as *f* the point on the paper where *d* touched the line *a b*
8. Using *d* as a pivot, fold the edge *d e* over until corner *e* rests on *f*; crease *d g*. (Fig. III.)
9. Fold backward to coincide with *c d* the part marked *x'*. Crease and tear off this portion. (Fig III.)

This gives the equilateral triangle Fig. IV.

10. Fold along the altitude *b f*, and fold corner *f* forward to *e* (Fig. V.)
11. Open out the triangle, crease the two lines just obtained, and tear out the corner at 1-2. (Fig. VI.)
12. Treat the other two corners similarly.
13. Fold the three gummed tickets along one diagonal and attach as shown in Figs. VI. and VII.

XVI.—TRIANGULAR CONFECTION DISH.

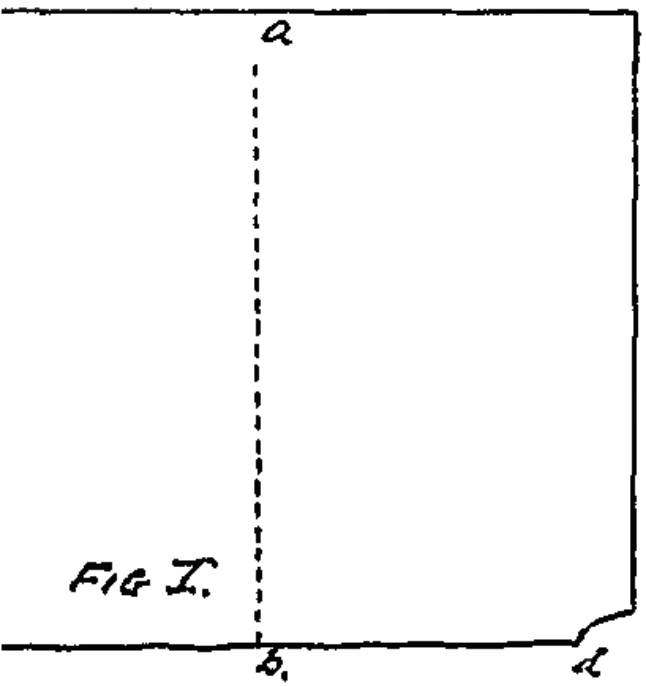


FIG I.

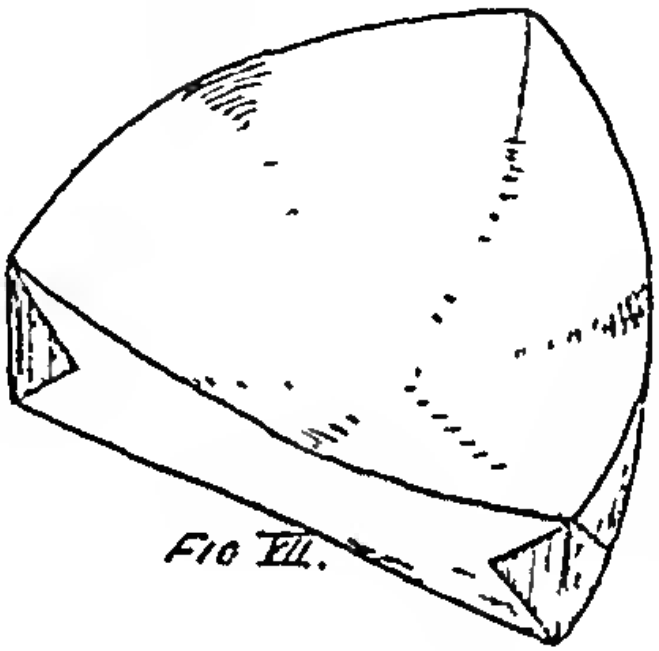


FIG III.

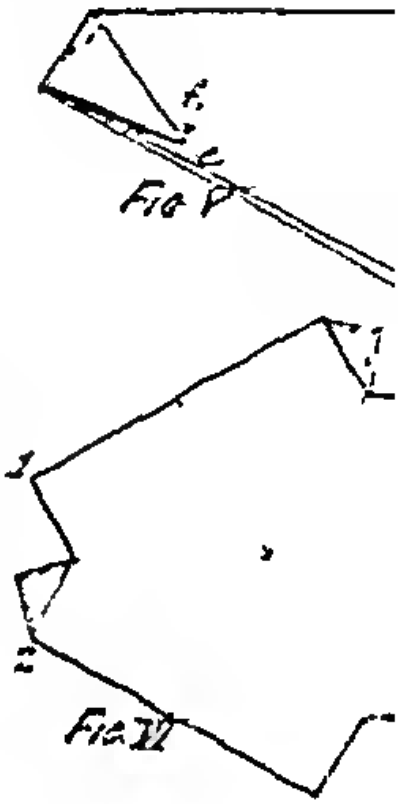


FIG V

FIG VI

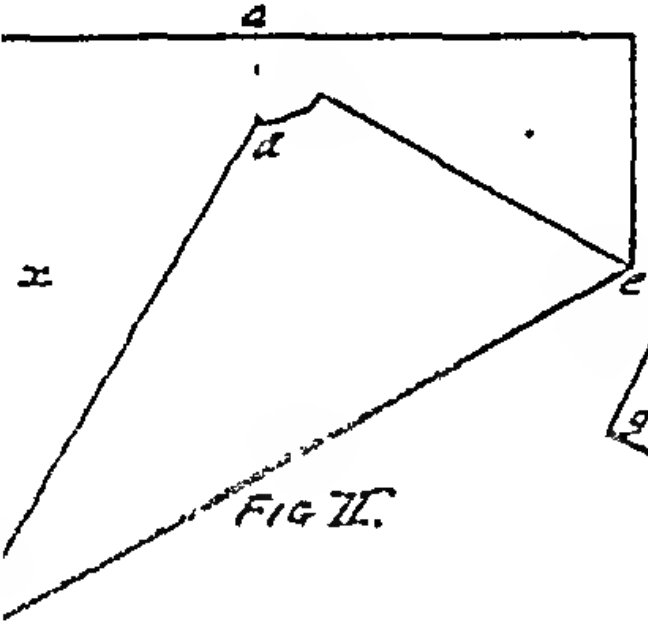


FIG II.

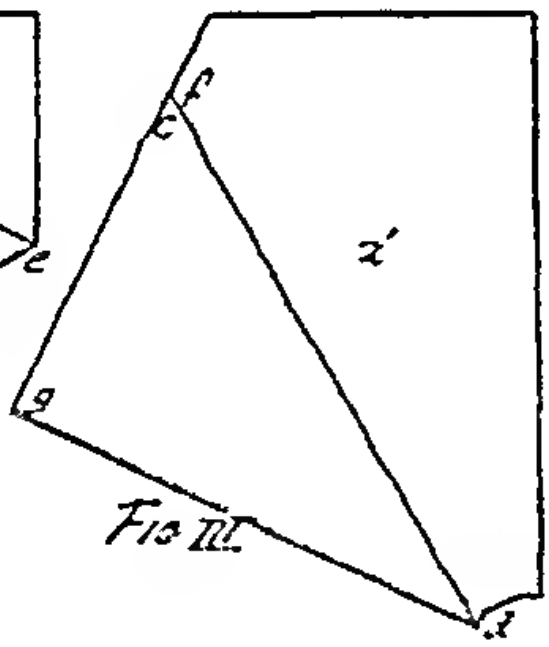


FIG III.

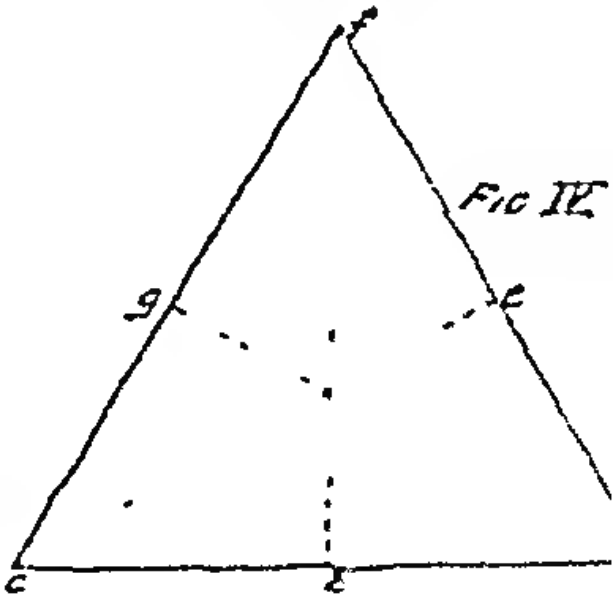


FIG IV.

XVII.—SQUARE AND TRIANGULAR PYRAMIDS.

MATERIAL: Tinted Paper.

METHOD.

1 Prepare the triangle *c d f* with torn edges according to instructions given in previous model.

2 Turn the figure over, so that the lines of altitude *f b*, *e c*, and *g d*, will show convex folds.

3 Fold the corners *f*, *d*, *c*, into the centre of the triangle, and crease the resulting edges 1-2, 3-4, 5-6. (Fig. I.)

4 Fold so that 1-2 coincides with *c d* and crease edge 6-3. (Fig. II.)

5 Repeat to obtain the creases 1-4 and 2-5. (Fig. III.)

6 Hold the model between the forefinger and thumb of the hands, allowing the convex fold at *e* to pass forward to *z*, and corners 2 and 3 to come together, fold down the triangular flap *f* to the inside to keep 2 *e* 3 in position (Fig. IV.)

7 Repeat with the two remaining sides and a Square Pyramid will result. (Fig. V.)

8 For the Triangular Pyramid, the convex fold at *g* would be placed alongside that of *e* at *z*, while the remaining side would be treated as for Fig. V. This gives the Triangular Pyramid Fig. VI.

XVII.—SQUARE AND TRIANGULAR PYRAMIDS.

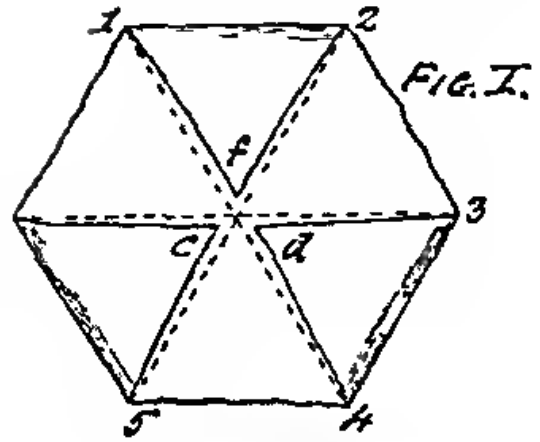


FIG. I.

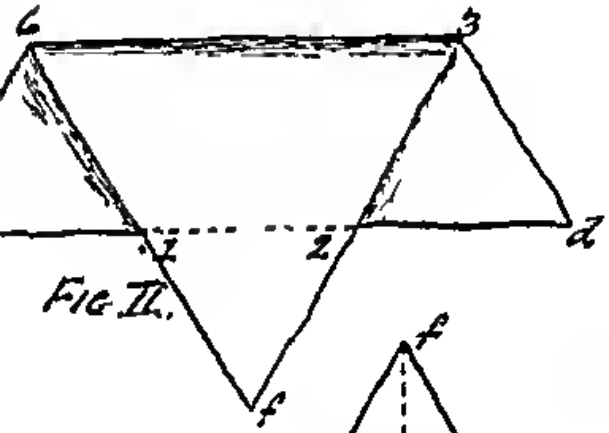


FIG. II.

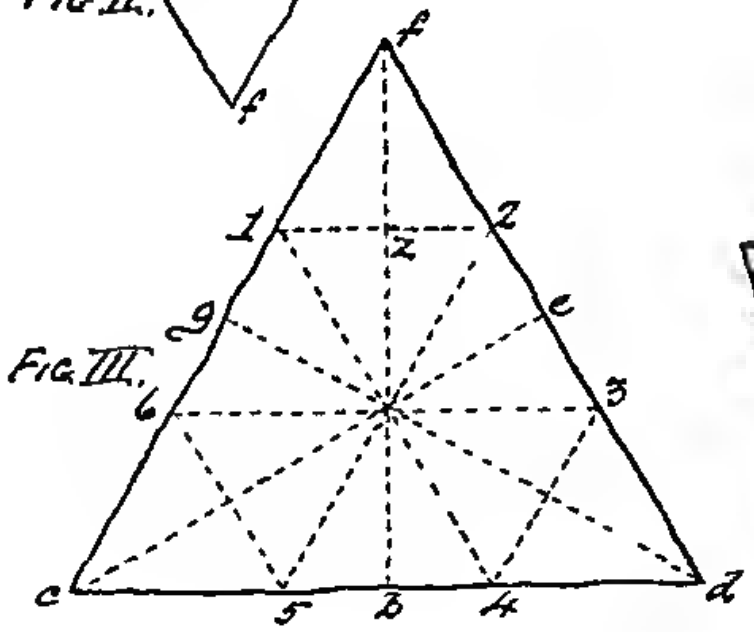


FIG. III.

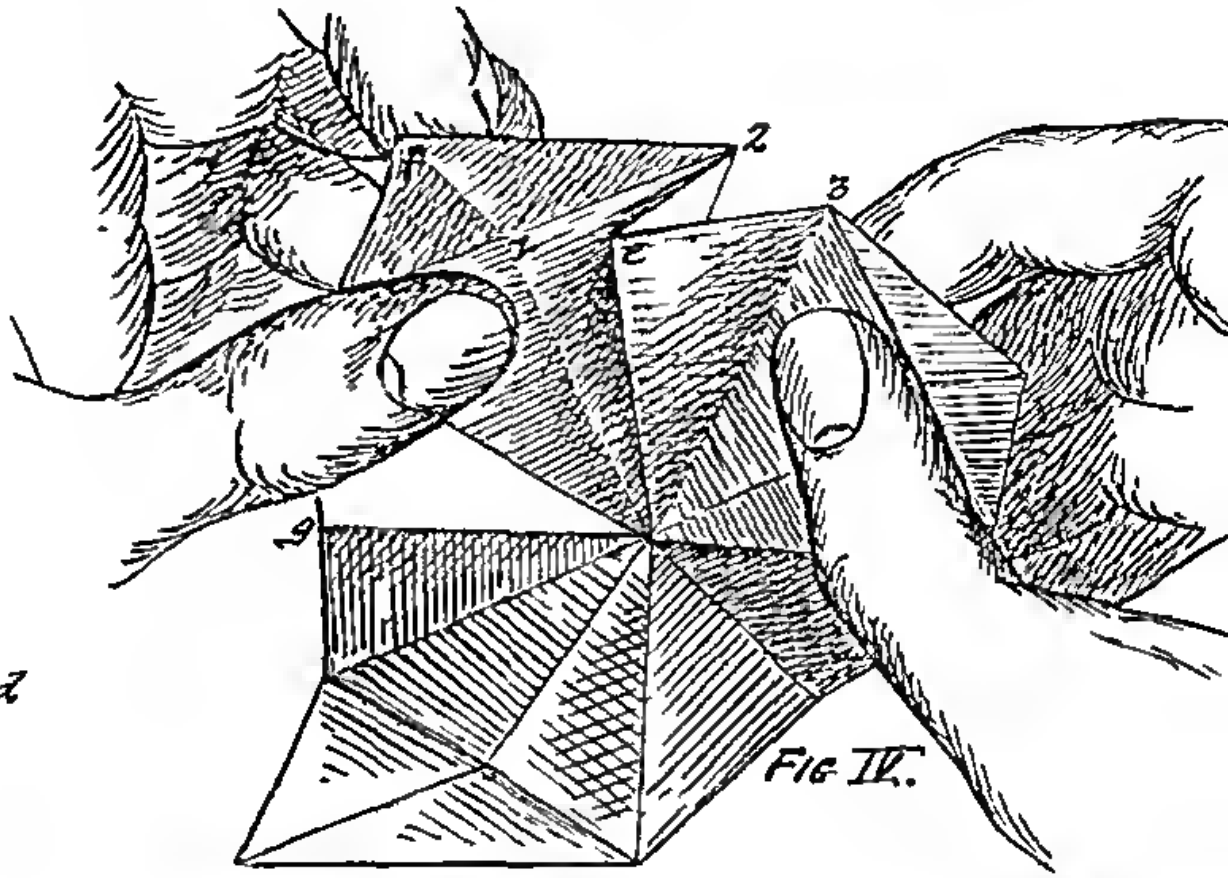


FIG. IV.

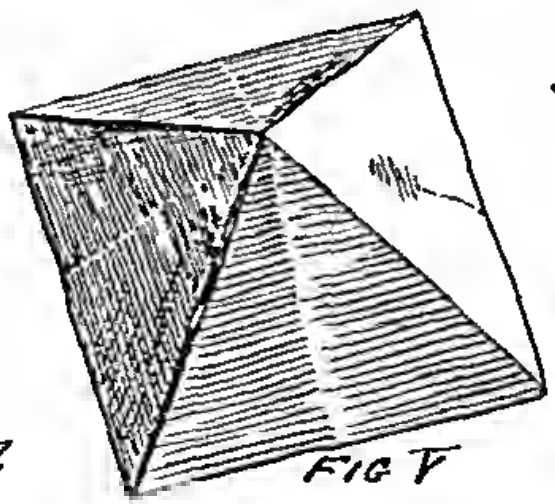


FIG V

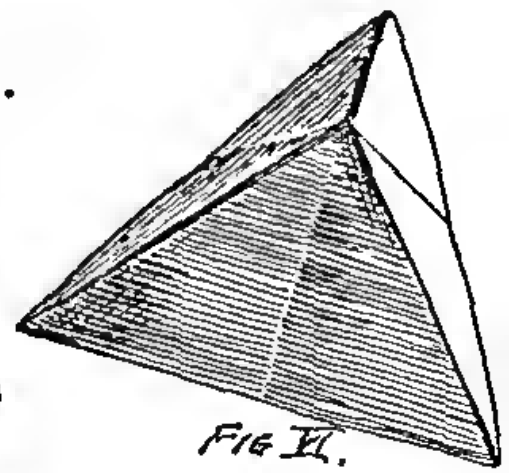


FIG VI.

XVIII.—BOX WITH DIVISION

MATERIAL Tinted Paper, Gummed Strip, 4″ × 1″

METHOD

1 Tear a rectangle 7½″ × 5″ and fold into five equal vertical strips

2 Make the two long horizontal folds 1½ from the upper and lower edges

3 Turn the paper over, and sub fold, along the centre lengthwise, the middle and two end vertical strips

4 Crease sharply all the folds thus obtained, and tear along the creased parts as shown in Fig I

5 Sub-fold the end units of the second and fourth vertical strips as at 3 4, Fig I

6 Arrange the paper as in Fig II, the sub folds here being convex

7 Turn the edge marked 1 2 round to the right so that it lies within the two thicknesses of paper formed by the fold 3 4 (Figs I and II)

8 Repeat with the other three similar parts, thus forming the upstanding sides of the box

9 Connect these sides to the ends of the box by bringing the double folded parts 5 6 7, down over them, and close up to the centre division

10 Fold and tear the gummed strip across the centre transversely, and mark off from the cut ends of each half, two parts ¾″ long (Fig III)

11 Crease across the strip at these marks also crease and tear down the centre of the large end unit (Fig III)

12 Tear off the four small corner parts shown on Fig I to allow the gummed strip to adhere to the double thickness on the inside of the box Attach the strip fixing the inside part first (Fig IV)

The alternative (Fig V) shows the centre division used to form the back of a box with lid attached A strip of thick paper 5″ × 1 is bent round the front and ends of the box on the inside This serves to grip the lid when the box is closed Pupils making this box should be allowed to cut the gummed strip into tickets for fastening, and decorating it, according to their own ideas

XVIII.—BOX WITH DIVISION.

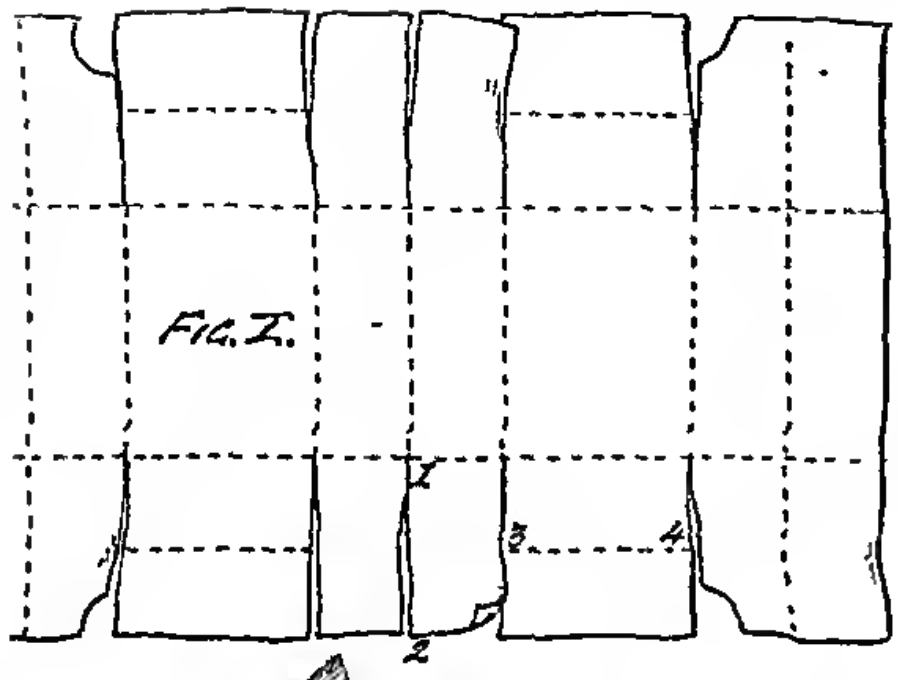


FIG. I.

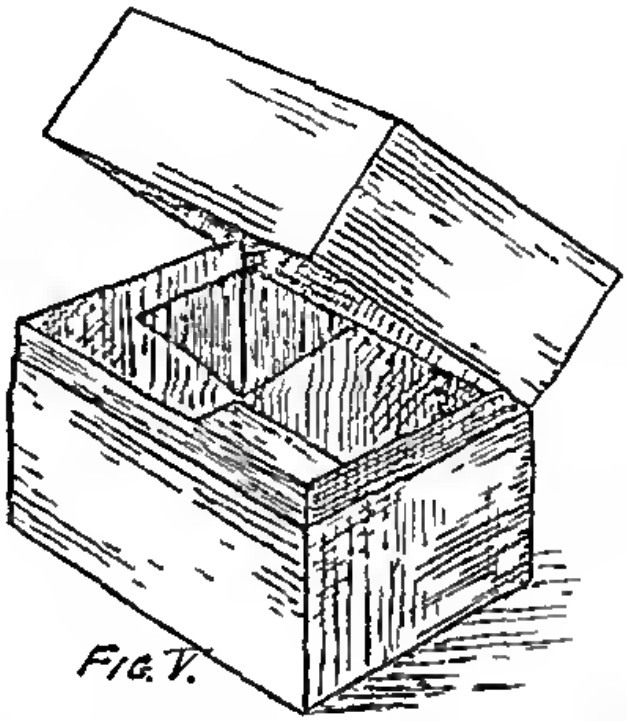


FIG. V.


FIG.

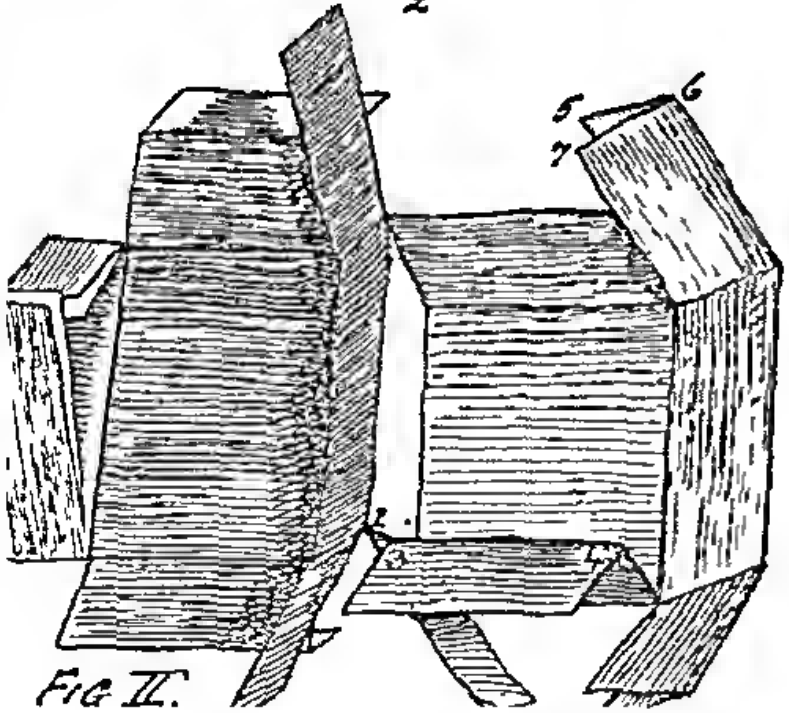


FIG. II.

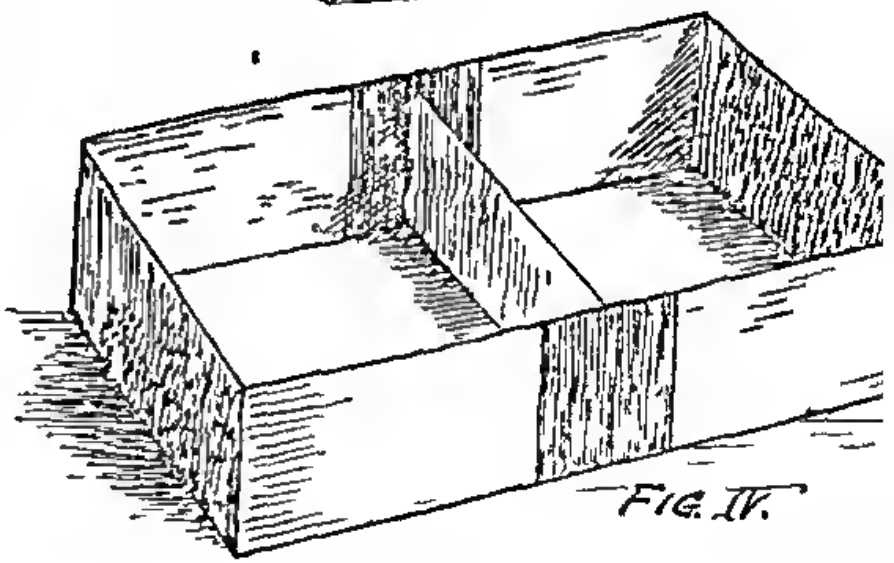


FIG. IV.

XVIII.—BOX WITH DIVISION

MATERIAL Tinted Paper Gummed Strip, 4" × 1"

METHOD

1 Tear a rectangle $7\frac{1}{2}$" × 5" and fold into five equal vertical strips

2 Make the two long horizontal folds $1\frac{1}{2}$" from the upper and lower edges

3 Turn the paper over, and sub fold, along the centre lengthwise the middle and two end vertical strips

4 Crease sharply all the folds thus obtained, and tear along the creased parts as shown in Fig I

5 Sub-fold the end units of the second and fourth vertical strips as at 3 4, Fig I

6 Arrange the paper as in Fig II, the sub folds here being convex

7 Turn the edge marked 1 2 round to the right so that it lies within the two thicknesses of paper formed by the fold 3 4 (Figs I and II)

8 Repeat with the other three similar parts, thus forming the upstanding sides of the box

9 Connect these sides to the ends of the box by bringing the double folded parts 5, 6 7, down over them, and close up to the centre division.

10 Fold and tear the gummed strip across the centre transversely, and mark off from the cut ends of each half, two parts $\frac{3}{4}$" long (Fig III)

11 Crease across the strip at these marks, also crease and tear down the centre of the large end unit. (Fig III)

12 Tear off the four small corner parts shown on Fig I to allow the gummed strip to adhere to the double thickness on the inside of the box. Attach the strip fixing the inside part first (Fig IV)

The alternative (Fig V) shows the centre division used to form the back of a box with lid attached A strip of thick paper 5" × 1" is bent round the front and ends of the box on the inside This serves to grip the lid when the box is closed Pupils making this box should be allowed to cut the gummed strip into tickets for fastening, and decorating it, according to their own ideas

XVIII.—BOX WITH DIVISION.

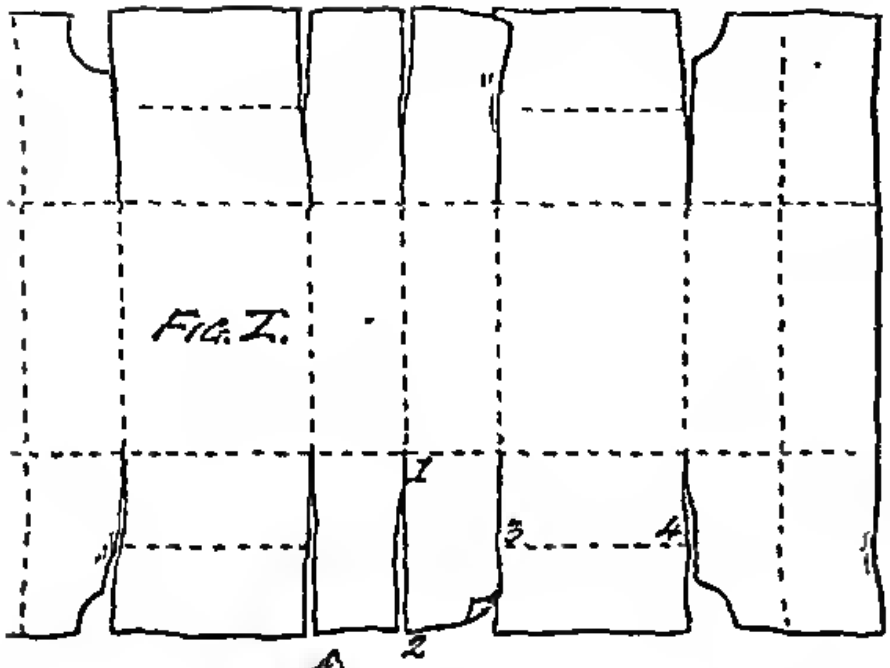


FIG. I.

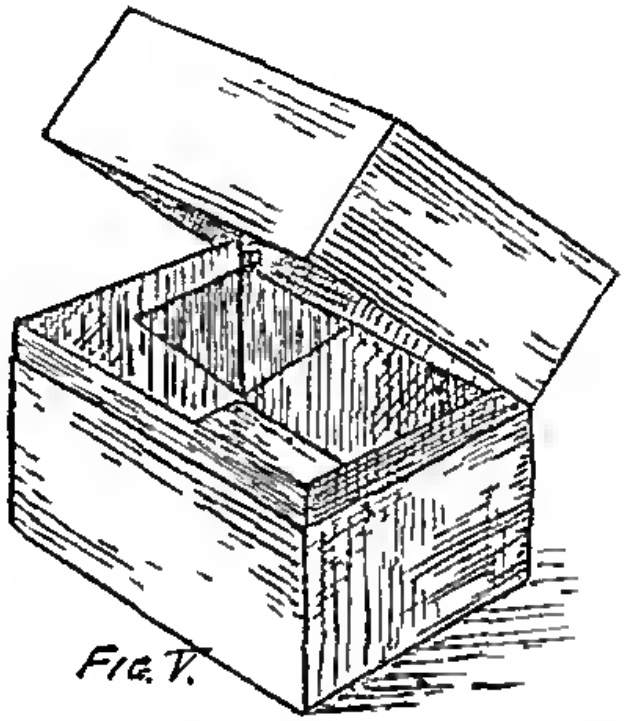


FIG. V.


FIG.

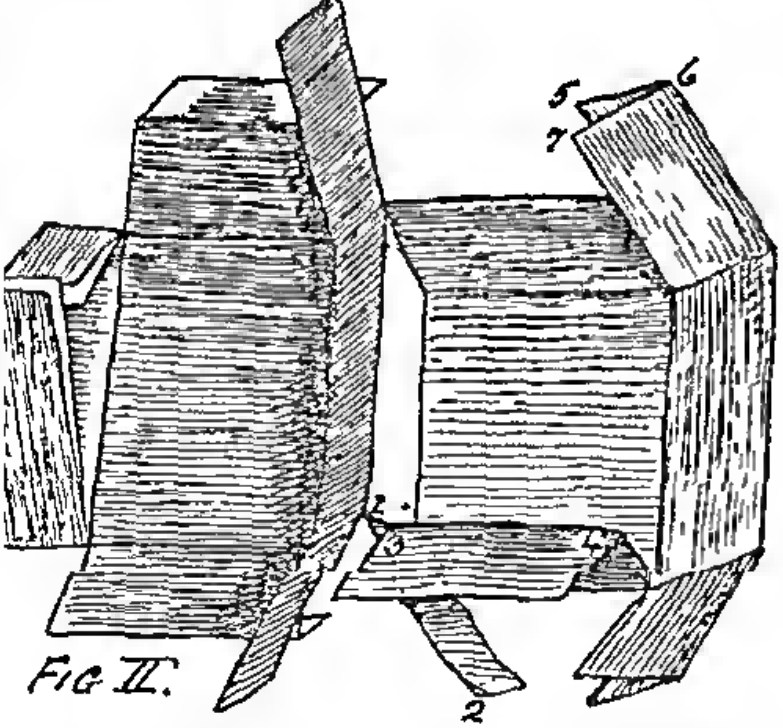


FIG II.

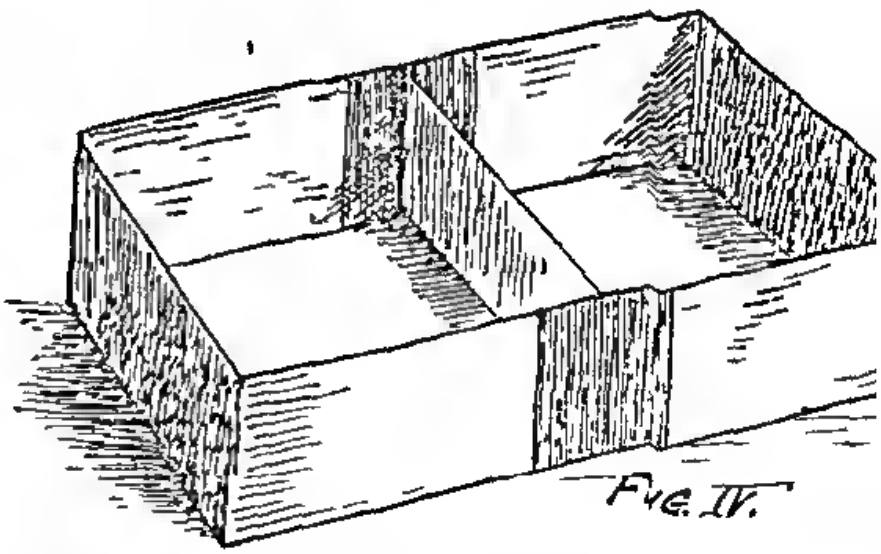


FIG. IV.

XIX —INDIAN CANOE

MATERIAL for Models Nos XIX., XX. and XXI Tinted Paper $11\frac{1}{2}'' \times 5\frac{3}{4}''$

MATERIAL for No XIX Right Angled Triangle, Two Square Gummed Tickets, One Strip $1\frac{1}{2}'' \times \frac{1}{2}''$

METHOD

1 Fold and tear the paper $11\frac{1}{2}'' \times 5\frac{3}{4}''$ into three right angled triangles without waste

2 Using one of the small triangles bisect the line *a b* in the point *d*

3 Rule a light pencil line from *d* to *c*

4 Fold corners *a b*, *c* to *d*, creasing firmly the lines 1 2, 3-4 2 4

5 Open paper out flat and tear off the triangles *a* 1-2 and *b* 3 4 (Fig I)

6 Fold corner *c* forward to the point where the line 2 4 intersects the line *c d* crease firmly and tear off triangle at *c* giving outline as in Fig II

7 Fold line 1 3 forward to line 2 4 and crease at *e f*

8 Lay the edge of the card ruler on point *c* (Fig II), and mark off two $\frac{1}{4}''$ spaces to right and left (Fig II)

9 Repeat these measurements on the line 4 2

10 Tear creased lines 4 and 2 to points 5 and 6

11 Crease and tear lines 7 and 8, removing waste, also fold along lines 5 and 6 (Fig II)

12 Fold along a diagonal the two square tickets and attach along with the gummed strip as in Figs III and IV

13 The small corners 7 and 8 (Fig III) should be torn off to allow the gummed strip to fix both thicknesses of paper on the seat

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This model and the one following may be used as actual toy sailing craft if after the models are made, two coats of glue size and one coat of varnish be applied to make them waterproof

XIX.—INDIAN CANOE.

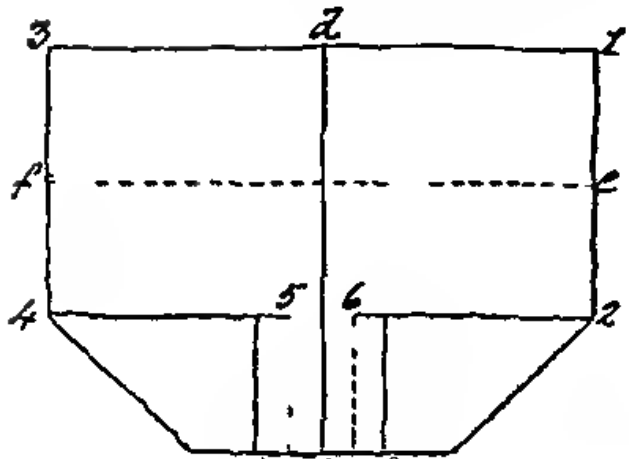

FIG. II.

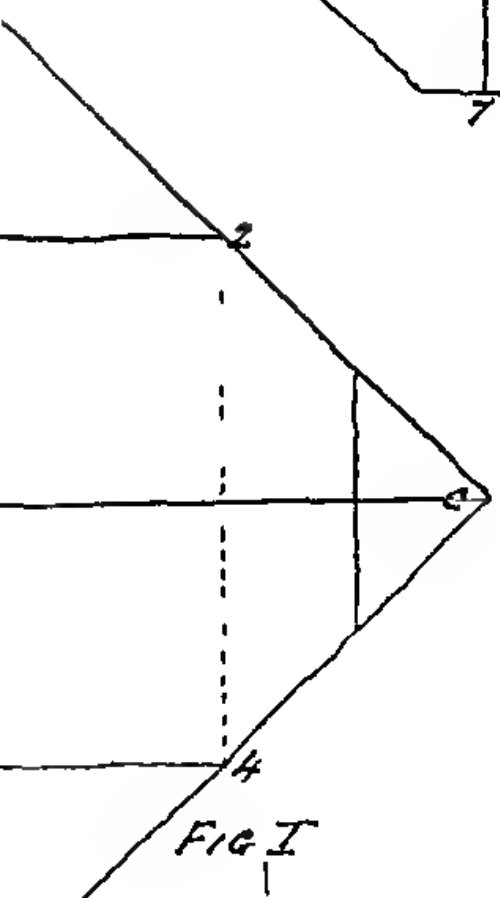

FIG. I.

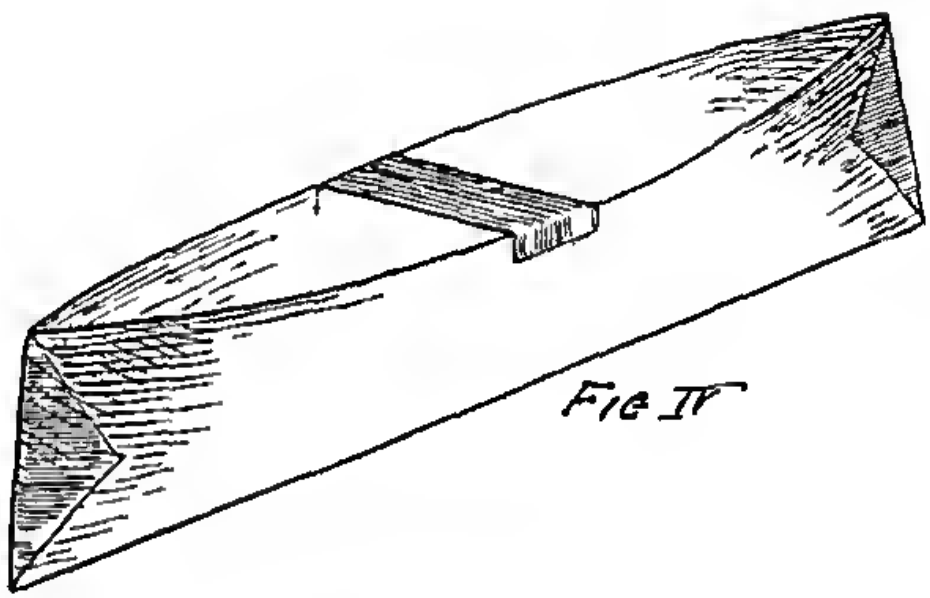

FIG IV

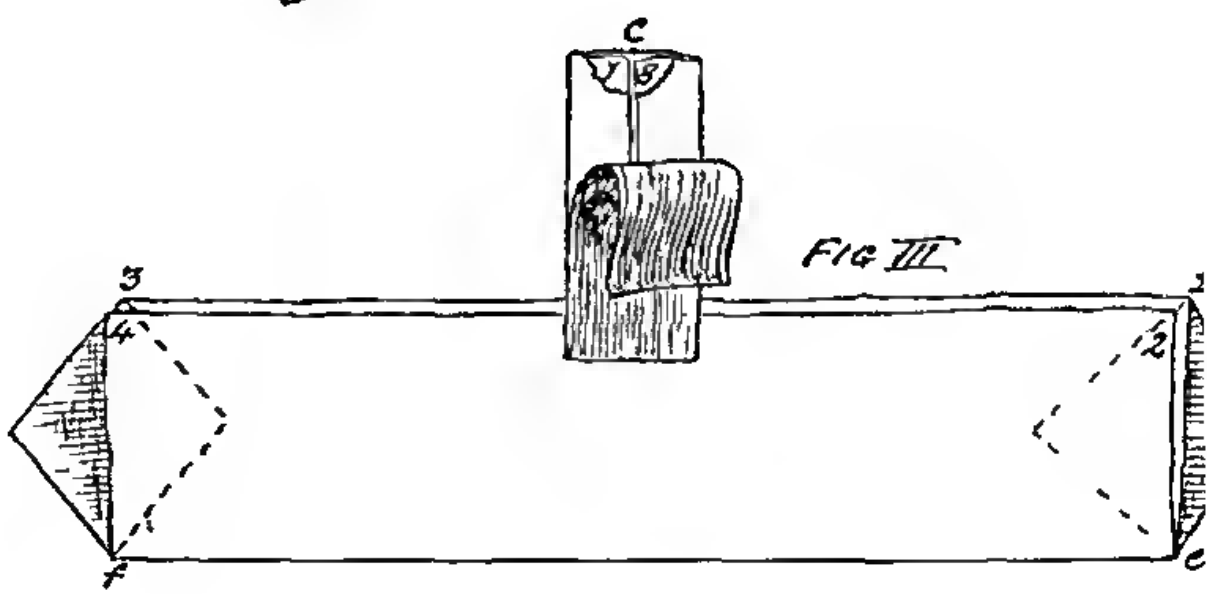

FIG III.

XX—COBLE

MATERIAL Right Angled Triangle **Two Square Gummed Tickets** One Gummed Strip $1\frac{1}{2}'' \times \frac{1}{2}''$

METHOD

1 Use the remaining small triangle previously torn

2 Draw pencil line from *d* to *c* and fold corners *a b c* to *d* creasing the lines obtained (Fig I)

3 Fold corner *b* to point 3 crease *g f*

4 Tear off triangles *a* 1 2 and *g f b*

5 Fold and crease line *e f*

6 Fold corner *c* over to the point where the line 2 4 intersects the line *c d* mark as at *h*

7 Fold corner *c* to *h* crease and tear along line 5 6 (Fig I)

8 Tear along fold from point 2 to line *d c*

9 Fold torn part of line 2 4 over upon the untorn part and crease from point 5 (Fig I)

10 Tear along the line 5 starting at the right angled end of the line and remove triangular part (Fig I)

11 Fold over newly torn edge and crease along the line *d c* to obtain the position of the parallel line at 6

12 Crease and tear out adjacent triangle thus obtained

13 Fold and crease diagonal 3 *f* also fold backward the line 7 8 (Fig II)

14 Fold and tear square ticket as in Fig III and attach the untorn half along the line 3 4 Fix the other square at 1 *e* (Fig II)

15 Fold line *e f* turning the angle 4 8 *f* inward close against the line 3 *f* (Fig IV) Turn in the triangle 3 *g f* and secure with *x x* of gummed ticket Fix the free half of square ticket to edge *e* 2

16 Tear the gummed strip across the centre Tear small corners off both ends of line 5 (Fig II) keep free flap of seat on top and fix as shown in Fig V

XX.—COBLE.

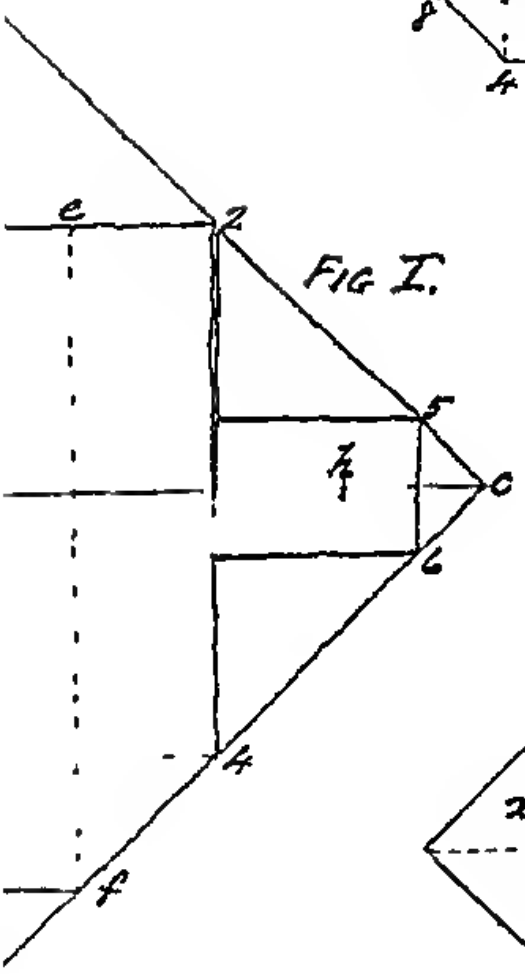

FIG I.

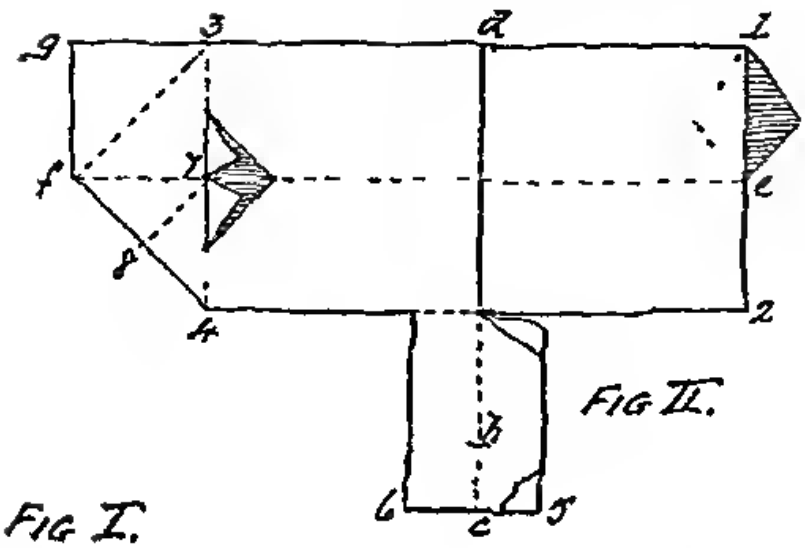

FIG II.

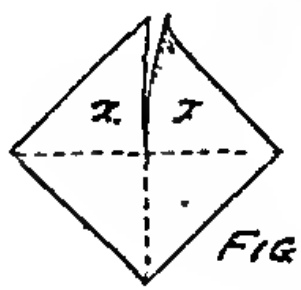

FIG III.

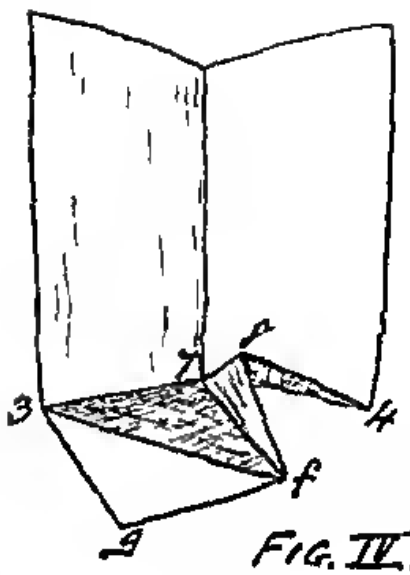

FIG. IV.

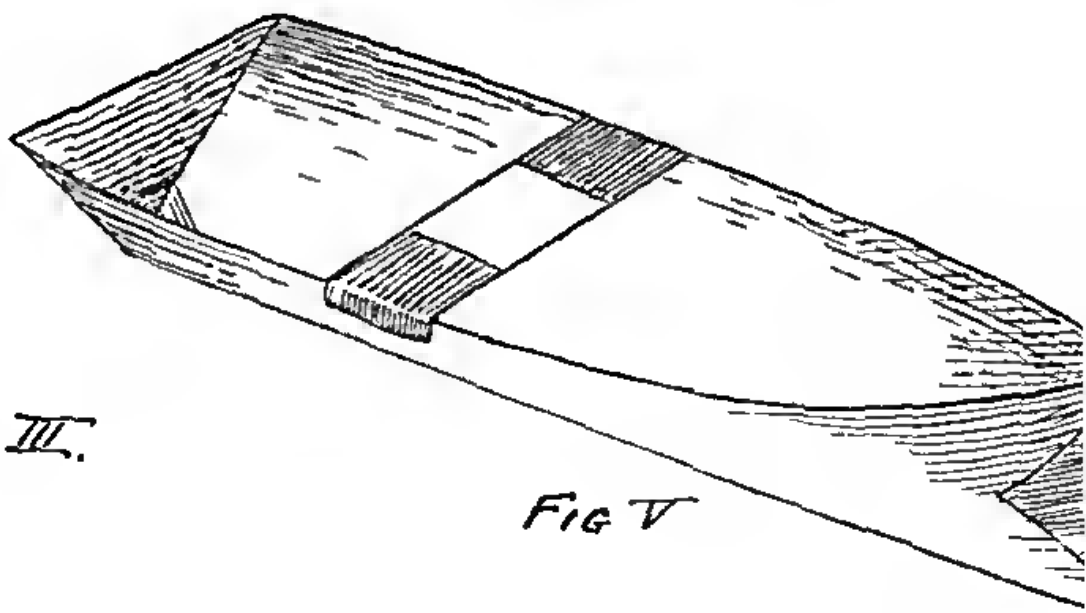

FIG V

XXI —BONBONNIÈRE.

MATERIAL Right Angled Triangle, Two Square, and Two Triangular Gummed Tickets

METHOD

1 Take the large remaining torn triangle, fold and crease the three horizontal lines (Fig I)

2 Fold and crease the six vertical lines (Fig I)

3 Tear off the three corner triangles, and tear along the two horizontal lines from both ends as far as the centre vertical lines (Fig I)

4 Fold and crease along their centre line, the two end triangles of the middle horizontal strip Tear off the free upper half of both triangles (Fig I)

5 Turn the paper over, so that all creases previously made have their convex side next the operator

6 Fold and crease along the lines 1 2, 3-4, 5-2 (Fig I)

7 With the paper still folded along the lines 5 2 put on the four gummed tickets all on the top side of the paper (See positions of tickets Fig II)

8 Turn the paper over, the tickets will now be on the under side. (Fig II)

9 Turn up to right angles with the desk, the sides *a* and *b*, and the ends *c* and *d*

10 Turn triangle *e* round outside the end of *c*, moisten gummed ticket attached to *f*, turn triangle *f* round to meet triangle *e*, and secure the two triangles with moistened ticket

11 Repeat with the other end, when they will appear as seen at left hand of drawing (Fig III)

12 Turn the box on end, fold over the triangle 1 3 2 on top of upstanding triangle then fold corner 1 over to 2, creasing the doubled line 3 4 Moisten and attach gummed strip of ticket to inside end of box as shown at right hand of drawing (Fig IV)

XXI.—BONBONNIÈRE.

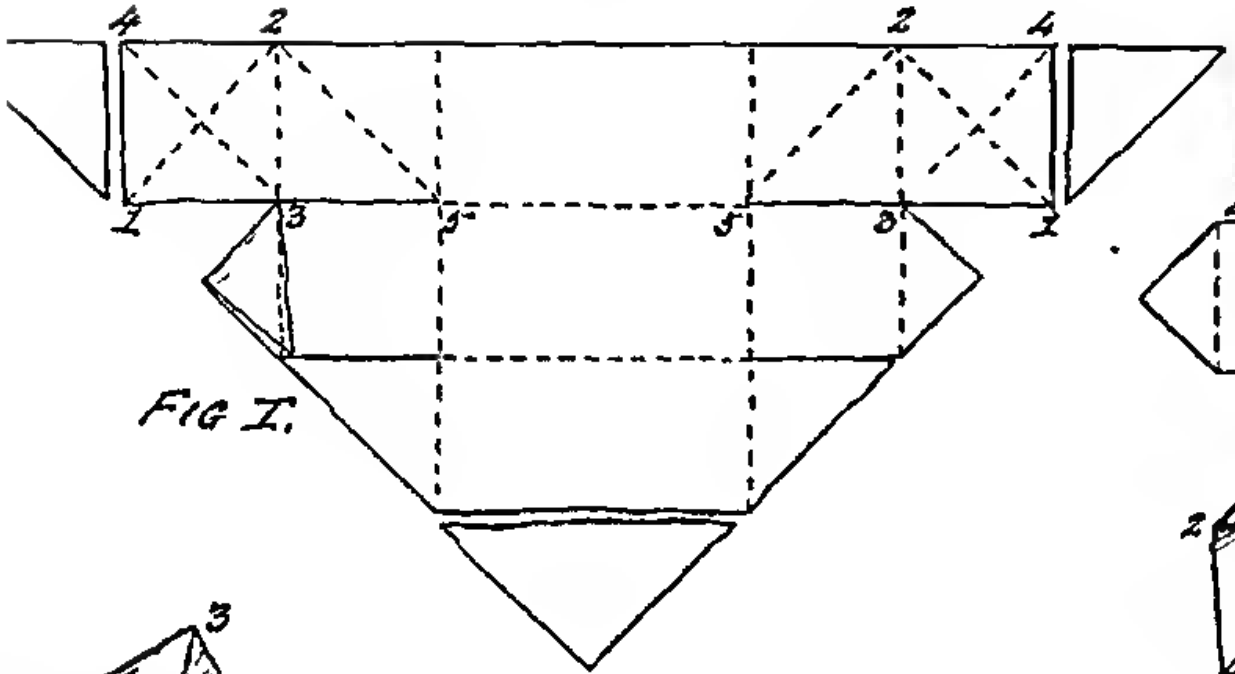

FIG I.

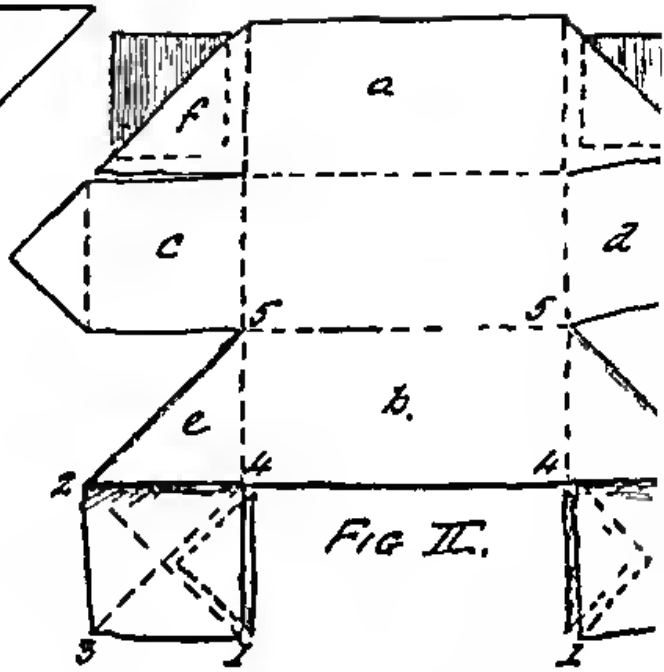

FIG II.

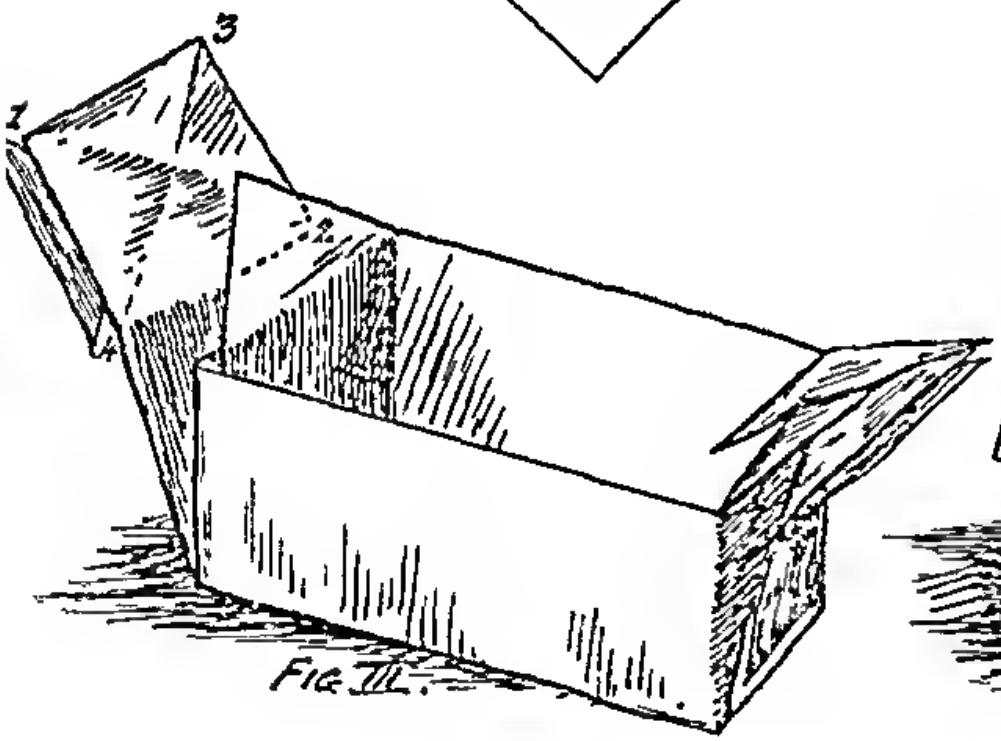

FIG III.

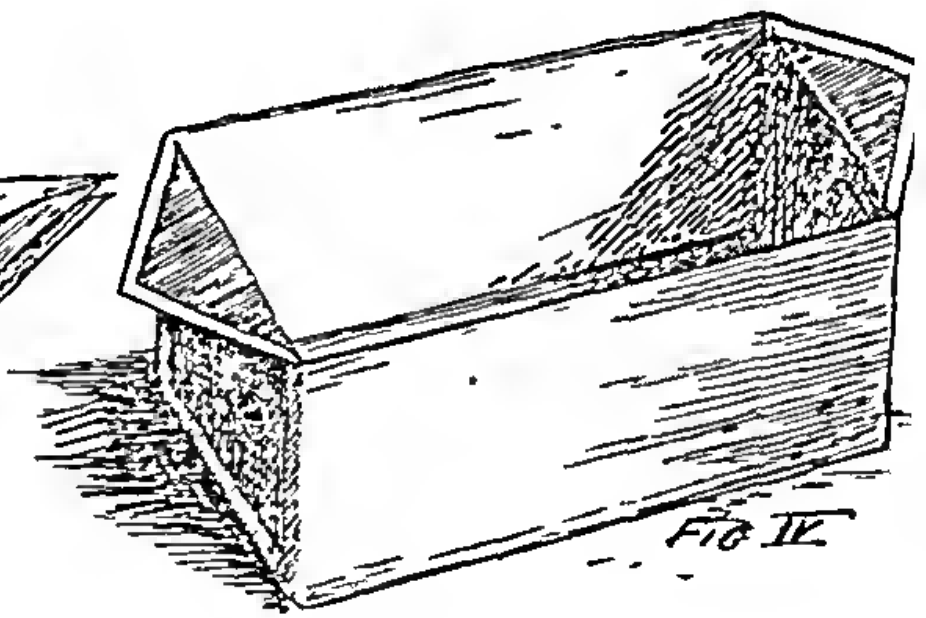

FIG IV.

XXIII.—VANITY BAG

MATERIAL Tinted Paper, Two Square Gummed Tickets.

METHOD

Instructions 1 to 7 are as given for Model No XVI, Page 48 (The equilateral triangle to be fashioned for this model is to have $9\frac{1}{2}$" sides, not $7\frac{1}{2}$" as in the case of Model No XVI)

8 Lay the paper out flat and fold along the line *f b*

9 Mark with the letter *x* the paper to the right of the torn edge *f c*

10 Fold this part *x* backward to coincide with torn edge *f c*, crease sharply and tear off

NOTE—This gives a triangle with only two lines of altitude indicated, viz — *f b* and *c e*

11 Fold the corners *f*, *c*, *d* to the centre point of the triangle crease the folds and tear, thus obtaining the hexagonal form 1, 2, 3, 4, 5, 6, as outlined in Fig I

12 Fold backward along the line 2-5

13 Fold the square gummed tickets along one diagonal, and attach as in Fig II

14 Prepare a very fine three strand raffia plait 10" long with a knot at each end

15 Fold inward the edge *e* 2 close to 2 *f*, and the edge *b* 5 to 5 *c*, insert the plait and fix the tickets at *e* 3 and *b* 4 (Fig III)

XXIII.—VANITY BAG.

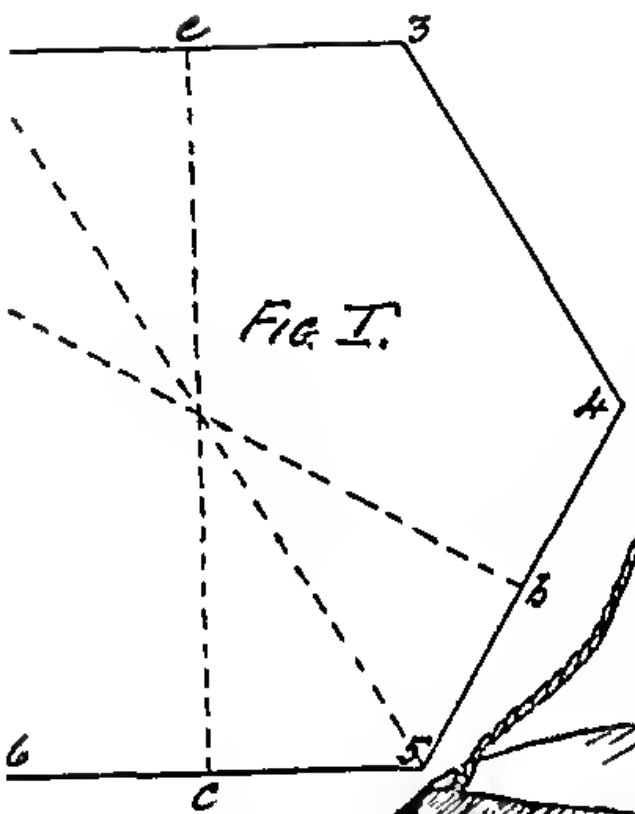

FIG. I.

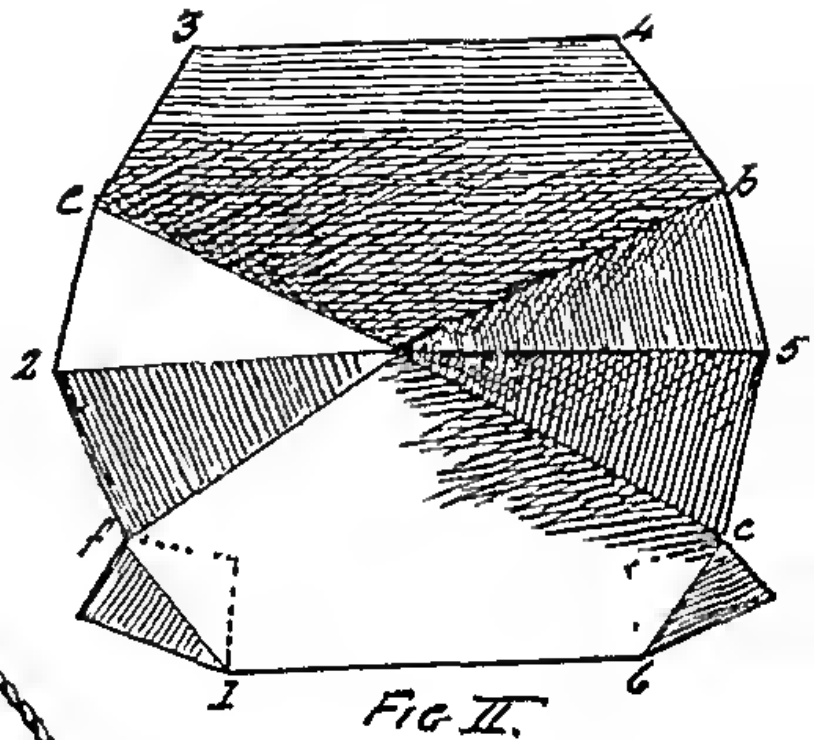

FIG. II.

FIG. III.